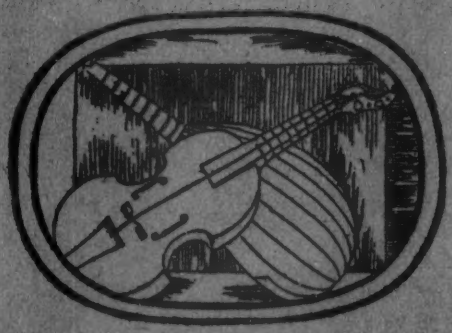
THE Galpin Society JOURNAL



JUNE 1956

IX

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THE GALPIN SOCIETY was formed in October 1946 with the object of bringing together all those interested in research into the history of European musical instruments. Its name commemorates the pioneer work of the late Canon Francis W. Galpin; its aims are to promote the study of the history, construction and functions of instruments of music and all cognate subjects, and to further this research by the publication of a JOURNAL and by all other practicable means. The Society plans to compile and publish bibliographies, catalogues and monographs on organological matters.

The Society is non-profitmaking; application for membership may be made by anyone, irrespective of nationality or country of residence. The annual subscription (one guinea) entitles the member to one free copy of the Society's JOURNAL for that year, and to a substantial reduction in the prices of the Society's other publications.

The Galpin Society

JOURNAL

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The responsibility for opinions expressed in contributions to the JOURNAL rests with the writers.

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Gerald Hayes, O.B.E., 1889–1955*

HAYES'S father was a novelist and a friend of Samuel Butler, and Hayes himself was a regular attendant at the Erewhon dinners organized by Festing Jones in honour of Butler's memory. Hayes was by profession a cartographer, and had a distinguished career in the office of the Admiralty Hydrographer until, a little while before he retired from the Civil Service, he was transferred, because of his long interest in Whitley Councils and staff matters, to the Establishment Department of the Admiralty.

Among his varied interests he was a student of the Georgian language and literature, and was in close touch for some time with Georgian exiles. He was a correspondent of Ezra Pound, whose published correspondence contains some letters addressed to Hayes on the subject of old music. Hayes was a brilliant pianist, with a special liking for Scriabin, but the influence of Dolmetsch, of whom he was an early and devoted disciple, led him to the study and practice of early music. He played the viol himself, but his natural aptitude was for scholarly research. It is difficult for people today to realize the impact made by the clear and concise exposition of principles in the first volume of his *Early Instruments of Music*. The second volume, on the viols, was, of course, more detailed, and a major work of scholarship. It is sad that no further volumes appeared, although the third (on the lute and other plucked instruments) was well advanced twenty years ago. Hayes was largely instrumental with Whittall in floating the Dolmetsch Foundation, and secured for it many eminent supporters. He was the originator and first editor of its organ, *The Consort*, and it was over this that Dolmetsch broke with him, as he had with so many of his faithful followers. This was a profound grief to Hayes's sensitive nature.

Fundamentally, as I have said, Hayes was a scholar with a single-minded purpose to seek out the truth and to clothe it in unambiguous language. But his wide range of interests, his fascinating conversation, his charm of manner and of character made him very much more than a mere scholar to his wide circle of friends.

LIONEL GLOVER

* The sad death of Gerald Hayes, Chairman of the Society's committee and successor to Thurston Dart as editor of this JOURNAL, was announced in a special notice sent to members of the Society last year. In addition to *The Treatment of Instrumental Musical* and *The Viols and other bowed instruments* (London, 1928 and 1930 respectively), his published writings on musical subjects included, at his death, *King's Music: an anthology* (London, 1937), and many articles in *Grove's Dictionary*, 5th edition, and in Scholes's *Oxford Companion to Music*.

GERALD HAYES was one of a very small body of men who, in the strenuous days of Arnold Dolmetsch's pioneering work on early instruments, not only accepted Dolmetsch's ruling principle that the original instrumentation is apt to be the most enjoyable; but also contributed to the new research needed to give that principle authority and substance. Hayes was never carried away by his enthusiasm, although his work rested on it; he had the true scholar's integrity, and as a result, the younger generation has come to rely upon his monograph on the viols and violins as very few books in this difficult field can safely be relied upon. It has been influential to a degree out of proportion to its small length, especially in America, where Bodley (N. Bessaroboff) acknowledges it as one of the starting-points of his own important work published in his *Ancient European Musical Instruments*

With all this Hayes was far too modest, and I think it came as a real surprise to him when the present Society did itself the good turn of securing his co-operation. He had not realized how much the greater world of musicians and scholars had come to appreciate him, and it gave him obvious pleasure. I am very glad we did this; he was a valuable man, and it was the right thing both for him and for us that he should be recognized and used as such by a body that co-ordinates the manifold activities now flourishing where so few good workers were active in his younger days.

ROBERT DONINGTON

TERENCE USHER

The Spanish Guitar in the Nineteenth and Twentieth Centuries

THIS outline of the more recent development of the guitar does not purport to be a history of the instrument, but deals only with the more recent aspects of its design and construction since the end of the eighteenth century. That particular point has been chosen because of three significant modifications which took place in a few decades around that time—the addition of a sixth string, the increase of body size, and the adoption of what has always been known as the 'Spanish style' of internal construction.

The lines of improvement of the Spanish guitar have followed the pattern of developments of the stringed instruments in general: the aim has been to increase the sonority and carrying power of the instrument so that the guitar may maintain its comparative position in regard to tone and volume, within the general increase of sound levels in music, as in the case of the transition in the bowed instruments from the viol family to the violin and cello, and in the keyboard instruments from the wood-frame pianoforte to the iron-frame pianoforte.

The outcome is that the guitar of the late eighteenth and early nineteenth centuries—an instrument of modest capacity hardly suited to public performance, though frequently so used by Sor, Carcassi, Carulli, Aguado, Coste and other virtuosi—is becoming a concert instrument of considerable volume and power in competent hands, capable (at present with some limitations) of guitar concerti with small orchestras, and of holding its own on terms of reasonable aural equality with the chamber groups of today.

The luthier-designer is at all times confronted with the fundamental problem that it is difficult, if not entirely impossible, to make a guitar which is at one and the same time ideal for playing in the small modern home and on the concert platform of a large hall. The subtle, but clear, characteristic tone of the guitar which has a comparatively simple fan-strutting system confined to the lower bout and fairly substantial wood thickness in the belly, is ideal for home playing; but upon the concert platform, this clear, ringing tone deteriorates, by absorption of the lower partials, to a tinny tinkle of sound. All else being equal, the larger the enclosed space in which the guitar is played, the greater the pro-

portionate absorption of these lower partials, and as economic factors nowadays force the professional artiste to play in halls holding from, at least, six or seven hundred people upwards to halls of the size of the Royal Festival Hall and the Free Trade Hall at Manchester, each holding audiences of three thousand, the luthier-designer is required to supply to the professional artiste a guitar with such a plenitude of lower partials that when some of these have been absorbed by the hall, the resulting tone will still be deep, resonant and well-balanced. Unhappily, no luthier has solved the dilemma, and few have even effected a satisfactory compromise: faced with the enforced choice of one or other type of tone, the luthier making a concert guitar wisely chooses to overload the guitar with lower partials by the more complex strutting systems and/or thinner belly wood later to be described, so that on the concert platform, where the artiste's living is made, the result will be satisfactory. But when played in a small room, the guitar's tone is then too thick for the interpretation of many works, particularly those originally intended for the lute or vihuela.

Whether any increase of volume and tonal depth in the Spanish guitar was, in fact, desirable, must be left to the plane of aesthetics, since development is not always artistically synonymous with improvement. Changes in musical instrument design arise from the demands of virtuoso performers on the one had, and from the requirements of revolutionary composers on the other hand. In Beethoven's increasing deafness may, perhaps, be seen the seeds of the powerful iron frame pianoforte of today. But though the works of Franz Liszt, by their breadth, and Bela Bartok, by their percussive demands, cannot be imagined as being adequately interpreted upon a Broadwood wood-frame grand of 1885, those of us who have heard one of these old pianofortes properly restored, or have played a modern reproduction of the Viennese fortepiano, may be forgiven if we are led to wonder whether the earlier music can in turn be adequately interpreted on the massive iron-frame concert grand pianoforte. The guitarist is today in a similar quandary: a good part of his repertoire consists of transcriptions of Elizabethan English and Continental lute music, and many of us have grave doubts whether the modern *guitarra de concierto* can reproduce the dry, bleached cleanliness of tone essential to the successful interpretation of such music. But we must leave these questions of taste to other pens. Perhaps the truth is that a guitar can no more be a lute than a clarinet can be an oboe, or a piano a harpsichord; and if we want to use each tone colour in particular works, we must use both instruments.

Since changes in the Spanish guitar design have not been confined to

any particular aspect of its construction, it will be necessary, after a general survey, to deal with each aspect in turn in order to appreciate the overall development which has taken place.

GENERAL CHARACTERISTICS (fig. 1)

By the end of the eighteenth century the guitar was a familiar instrument throughout Europe: guitars are still extant of that period from Spain, France, Italy, Austria and Germany, and though one has not seen examples from Scandinavia, doubtless they exist.

One must be wary of generalizations, or of drawing inferences from the examination even of all the limited number of guitars remaining from that period, much less those which one has been fortunate to see. But it would be safe to say that at the end of the eighteenth century, and the beginning of the nineteenth; the design of the guitar, not inappropriately, was further advanced in Spain than in any other country. Already the Spanish luthiers had discovered the importance of belly-wood as thin as that of the lute (were not the Elizabethan lutanists advised periodically to remove the belly of their lutes and to iron it flat again after the warping of its extremely thin wood under the string tension?) and a rudimentary system of lateral barring had replaced the transverse barring below the belly. (This question is more exhaustively dealt with under a later head.) But in other countries, though the wood and workmanship were good, luthiers retained the relatively thick belly and tranverse barring of earlier days.

In all countries, the guitar was still narrow across the upper and lower bouts, and comparatively wide in the waist; the many guitars in the paintings of Watteau all have this characteristic, though one realizes that some will be *chitarre battente*. But decade by decade, the nineteenth-century luthiers increased the width of the bouts, particularly the lower bout, in proportion to the body length. In Spain and Italy the length of body remained fairly constant, and the measurements of upper bout, waist and lower bout progressively increased. But in France and Germany the body length in some instances became a little less, the waist remained the same, and the upper and lower bouts increased, so that the general form of the guitar tended to be that of a double-circle or figure-of-eight in North Europe and of two joined ovals in South Europe.

The Spanish head, too remained vigorous and masculine, widening aggressively to the upper end, whereas the Italian and French heads, which had always widened less sharply, retained their feminine characteristics. The Lacote peg head of the early nineteenth century echoes, in miniature and in reverse, the figure eight of the body. On the whole,

the Spanish luthiers seem to have retained the peg head longer than Northern European luthiers, possibly because machinery to make the tuning machines was more readily accessible in North Europe where the Industrial Revolution was more advanced.

Since this article was begun, the writer, quite fortuitously, has

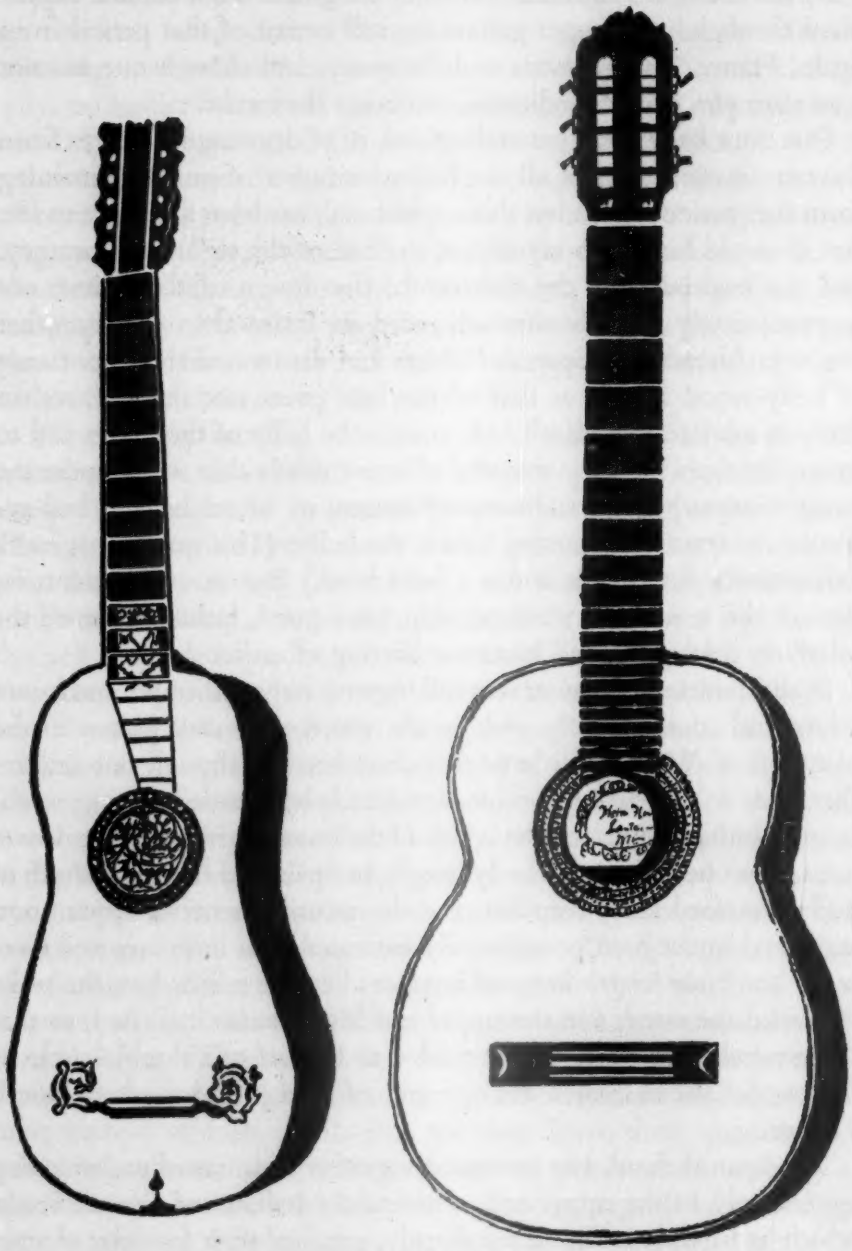

Fig. 1. *left* Guitar by Antonius Stradivarius (1680)
right Guitar by Hermann Hauser (1929)

acquired or borrowed in Manchester four guitars which enable a comparison to be made of instruments from 1790 to 1850. Photographs of these instruments, together with those of modern concert guitars by Clifford Essex and Harold Petersen, appear on Plates I and II and a brief description of the instruments is given below:

FRENCH GUITAR, UNLABELLED, PRESUMED *circa* 1790, known as the Cusworth Hall Guitar.

Head and fingerboard faced rosewood. Ebony bridge. Satinwood back and sides. Two transverse struts, one above and the other below the soundhole. Sides and back beautifully banded in darker lacquer beneath the varnish. Table and soundhole edges inlaid with black and yellow wood, but stringing is painted on.

Dimensions: Body length	$17\frac{3}{4}''$
Scale length	$24\frac{3}{4}''$
Upper Bout	$8\frac{1}{2}''$
Waist	$6\frac{3}{4}''$
Lower Bout	$10\frac{7}{8}''$
Depth at deepest point	$3\frac{7}{8}''$
Fingerboard width at nut	$1\frac{15}{16}''$
Body joins neck at 11th fret	
Total number of frets	17
(11 ivory on neck; 6 ebony on table)	

Back and table of guitar are both absolutely flat. Fingerboard is slightly ovalled. The tone is powerful, but coarse and crude.

This guitar, in shape and ornamentation, corresponds closely with instruments in the Watteau and other paintings and engravings of the eighteenth century; the style remained astonishingly constant until the century had turned. It may be seen from these engravings that the instruments had five pegs down each side of the head for the tuning of the five double strings usual at the time (see *Note* at end of article). The Cusworth Hall Guitar, however, has three pegs down each side of the head, but this retains in some degree the elongated shape designed to accommodate five pegs down each side. Either this indicates that the instrument was made soon after the change to six single strings, or the neck and head have been changed. But the bridge, which appears to be the original, bears only six single holes for the strings. The neck is screwed to the end block from the inside by a metal woodscrew, which may indicate a neck replacement. The general condition of the Cusworth Hall guitar is nothing short of remarkable; indeed, one does

not experience that indefinable 'feel' of antiquity which is apparent with other instruments of the time, or with the most modest Sheraton, Hepplewhite and even Regency furniture. One wonders whether this may, in fact, be a mid-Victorian reproduction, but what its purpose? Amateur theatricals at Cusworth in the Jane Austen manner (*Mansfield Park*)?

On the other hand, the guitar was bought at Cusworth Hall (near Doncaster) by a Galpin Society member, a couple of years ago. The mansion was built in 1750. Amongst the effects sold at the same time as the guitar was a guitar tuition manual bearing the title:

> *A New Tutor for the Spanish Guitar, containing a progressive selection of the most Favourite Waltzes, Rondos, Songs, Glees, etc.—composed by various authors and arranged by Felice Chabran. . . . London. Printed by Goulding, D'Almaine, Potter & Co., 20 Soho Square, & to be had at 7 Westmorland Street, Dublin.*

The following entry: 'Chabran, a composer of vocal and instrumental music, arranged for the guitar, and published in London about the year 1789' appears in *A Dictionary of Musicians from the earliest to the present time, comprising the most Important biographical contents of the works of Gerber . . . together with Upwards of a hundred original memoirs of the most Eminent Living Musicians and a Summary of the History of Music. Vols. I and II. Second Edition. London. . . .*1827. There is no entry in *Grove* (5th edition) for *Felice* Chabran, but under *Francesco* Chabran appears the following: 'Francesco Chabran (Ciabrarro) b. —— d. —— guitar player and composer. He published a Tutor for the Guitar in 1790. . . .' etc. If this tutor were bought for use with the Cusworth Hall guitar, it would date the instrument about 1790.

The other guitars, fortunately, are labelled and dated.

SPANISH GUITAR BY RAFAEL ROLDAN. Bears printed label: *Rafael Roldan me hizo en Malaga, Año de* 1797, the last figure of the date in ink.

Head, back and sides of rosewood. Flat rosewood fingerboard to 9th fret, remainder covered by extension of belly wood. Rosewood figure inlay on this extension, and similar inlays between bridge and end of guitar on belly. Ebony bridge (no saddle). Ivory nut. Eleven brass frets on fingerboard, five ebony frets on belly. Immature Spanish heel. Spanish head with six pegs on each side, and bridge with six pairs of string holes. Indicates six double strings, and is stage intermediate between five double strings and six single ones, giving a date to this fashion. Pearl diamond-shaped inlays in rosette round soundhole. Two transverse bars below belly, one above and one below the soundhole, as in the Cusworth guitar. No sign of lateral or fan barring, or residues

of glue from such bars. One must not, however, assume from this that fan barring was then unknown, as one finds modern guitars of Spanish luthiers which for cheapness were made with two transverse bars only. However, this Roldan is obviously of good quality and one would assume that the maker incorporated the then most advanced barring method. It probably comes from the transitional period when the new idea of lateral strutting had not been universally adopted in Spain.

Dimensions:	Body length	17½″
	Scale length	26″
	Upper Bout	9″
	Waist	6¼″
	Lower Bout	11″
	Depth	4″
	Fingerboard width	1 15/16″
	Total number of frets	17

Back is flat. Table is slightly arched, by affixing a bridge with an arched base. Contrasting stringing round edge of belly and back, and up centre join of back. Two-piece belly and back, as in the Cusworth Hall guitar. Not in playable condition; tone cannot be estimated, but craftsmanship, wood qualities and thicknesses indicate that it will be of less volume of sound but far greater refinement than that of the Cusworth instrument.

GUITAR BY FRANCISCO PAGES. The Pages family, established in Cadiz between 1794 and 1819, were the greatest guitar luthiers of their day. The eminent authority Emilio Pujol, in his treatise on nail and fingertip technique, *The Dilemma of Timbre on the Guitar*, equates the guitars of Pages, Torres and Enrique Garcia to the violins of Stradivarius, Guarnerius and other makers of the Cremona school. This Pages guitar bears the following label: Engraving of Violin and Bow crossed over a Guitar (bearing belly ornamentation almost identical to the Roldan guitar described above) laid upon open music books. Wording: *Fabrica de Francisco Pages, en la Rl. Ciudad de San Fernando. Año de* 1815 (last two figures in ink). Francisco Pages will be one of the family, San Fernando being a neighbouring town to Cadiz.

Back, sides and fingerboard of walnut. Head faced with walnut. Walnut bridge, no saddle. Back and belly slightly arched. Flat fingerboard extends to soundhole, over belly. Seventeen brass frets on fingerboard. Eleven and a half frets clear of body. The fingerboard of this Pages appears to be in two very thin layers, each of about 3/32″ thickness. The lower layer shows signs of the slots cut for frets, and the upper layer, of course, bears frets at the moment. The interesting point about

the lower layer is that it is evident that this did not extend beyond the eighth fret; one hesitates to try to remove the upper layer of fingerboard, but the evidence seems clear that, as in the Roldan guitar, at one time the wood of the belly extended along the neck for three frets towards the head. This extension of the belly wood has borne an edging of ebony which is still visible in the lower layer between the eighth fret and junction of body and neck.

The ribs and belly of the Roldan are joined by a continuous strip of kerfing, but the Pages belly is joined to the ribs by separate blocks of triangular section. This is the earliest example the writer has seen of this separate blocking, now generally acknowledged as giving a freer, yet equally secure support to the edge of the soundboard. Both guitars have the transverse barring supported by long block-strips glued to the ribs, which at one and the same time hold the bars in place and prevent the ribs from collapsing under the pressure of the barring at these points. The back ribbing is similarly supported. Two-piece back and belly. Plain walnut or rosewood purfling round edge of belly. Soundhole rosette of sections of ivory tubing, inlaid into a composition circle with contrasting wood stringing round the outside and inside. Further triple stringing at edge of soundhole. Two transverse bars above and below soundhole, as in Cusworth and Roldan guitars, *but also three lateral bars in the shape of an elementary fan:* the earliest example the writer has seen of fan barring in a guitar built in Spain. Head bears twelve pegs, bridge six pairs of holes. Ivory nut. Slightly more mature Spanish heel.

Dimensions:	Body length	18″
	Scale length	25½″
	Upper Bout	8⅜″
	Waist	6 15/16″
	Lower Bout	10¾″
	Depth	4¼″
	Fingerboard width	2″

The Pages guitar, which has been well used, is in excellent preservation and needs only minor repairs to cracks and purfling. It has been strung, and proves to have a sweet and mellow tone of great refinement.

GUITAR BY JUAN PERFUMO

Perfumo is listed by Prat (Diccionário de guitarristas) as a notable maker of guitars who modelled his style and craftsmanship on the school of Pages. This guitar bears the following label: Engraving of guitar (with a ribbon for slinging over shoulder) laid over a book of music. Label edged with engraved figuring. Wording of label *Me hizo*

en Cadiz JUAN PERFUMO. Calle de Flamencos, al salir a la calle Nueva No. 197. 1847 (all four figures printed).

Head of rosewood, inlaid satinwood strip. Signs that head has borne an unknown number of holes for pegs. Now converted to machine tuning, with English machines, since they bear the Crown and the initials V.R. Scalloped bone nut for six strings. Original bridge is replaced by German peg bridge. Rosewood back and sides; four strips of triple stringing laterally along the back, while the sides bear an equatorial band of triple stringing. Mature Spanish heel. Highly ornate large soundhole rosette of pearl arrows and crosses interposed between circles of triple stringing in rosewood and satinwood. Rosewood 'Star' inlay on belly, between bridge and end. Two transverse and five lateral fan bars. This, the Pages, and the Roldan guitars all have slipper design end-blocks at the neck end of the body. The guitar is in superb condition apart from the inappropriate bridge, and the tone, even with this bridge, is powerful and refined.

Dimensions: Body length	$18\frac{1}{4}''$
Scale length	$25''$
Upper Bout	$9\frac{1}{2}''$
Waist	$7\frac{5}{8}''$
Lower Bout	$12''$
Depth	$4\frac{1}{16}''$
Fingerboard width	$1\frac{15}{16}''$

Body joins neck at 12th fret
18 German Silver frets

PETERSEN GUITAR

The dimensions of this guitar, a modern concert guitar illustrated in Plate I, are:

Body length	$19''$
Scale length	$25\frac{1}{2}''$
Upper Bout	$10\frac{7}{8}''$
Waist	$9\frac{3}{8}''$
Lower Bout	$14\frac{3}{8}''$
Depth	$3\frac{3}{4}''$
Fingerboard width	$2\frac{1}{32}''$

19 nickel silver frets of T-section
Arm joins body at 12th fret
One transverse bar, and a complex system of lateral barring described, together with other internal details, in a later paragraph.

Back and belly appreciably arched. Back, sides and fingerboard of rosewood. Head faced with rosewood. Six machine tuning pegs. Spanish type bridge. Mature, outswept Spanish heel as in fig. 4c.

CLIFFORD ESSEX GUITAR

This guitar by Marco Roccia (Plate II) has two transverse bars and an empirical barring system, at various angles to the length, below the bridge. Further details are given in A. P. Sharpe, *The Story of the Spanish Guitar* (see bibliography).

From the photographs and descriptions of these six instruments, together with the many others described and illustrated by Sharpe, the gradual evolution of the general characteristics of the modern *guitarra de concierto* may be traced. An examination of the changes in individual, detailed parts of the guitar during the past century and a half is, perhaps, even more illuminating.

WOODS AND THICKNESSES

Generally speaking, similar woods are used today for the best instruments as were used in the eighteenth century—hardwoods such as walnut, rosewood, mahogany, maple, sycamore and satinwood for the back and ribs, and pine or spruce for the bellies. If there has been any development in this direction, it has been in the universal acceptance of palisander (South American rosewood) as the finest wood for back and ribs. The practice of veneering the ribs and back with a hardwood upon a softwood base has been entirely discontinued. Rosewood and ebony are still unequalled for the fingerboards, and a variety of woods are used for the neck. One cannot recall having seen an eighteenth-century guitar with a laminated neck though one believes they do exist, but there is an increasing tendency amongst the best luthiers nowadays to laminate the neck with woods of differing character, not just for ornament but to guard against warping and to bear the increased strain of the heavier stringing and greater scale length of today's instruments.

It is difficult to generalize about the thicknesses of wood used in the guitars of the past and in those of today. One cannot consider this question without relating the wood thicknesses to the overall size of the instruments, and to the strain imposed by the differing string tensions, then and now. But one can say with conviction, that the belly-wood thickness today is much less, in proportion to the overall size and the string tension, than it was in the eighteenth century, whereas the relative thickness of the back and ribs has remained fairly constant in proportion to the greater size and stresses. What has happened is that a new system of internal supports has been devised which enables the

comparatively thinner belly-wood to bear without collapse the strains of a wider belly and greater string tension. This subject will be developed under the head of *Barring*.

SCALE LENGTH

Guitars of all dates show a remarkable variation of scale length (i.e. the freely vibrating length between the bridge saddle and the bone or ivory 'nut' over which the strings pass to the tuning heads). One imagines that individual preference has forced luthiers to supply instruments of varying lengths to suit hands of varying sizes; but just as the keyboard instruments have finally evolved a standard octave span and key width, so the luthiers of today have apparently agreed a standard string length. Guitars of the past have varied in scale length from as little as 23″ to as much as 25½″: the Cusworth Hall guitar has a scale length of 24¾″. The luthier, of course, has to set against the added convenience and ease of handling of a short scale length, the loss of tone from shorter strings and the uncomfortable crowding together of the frets in the higher positions. In the end, he appears to have decided, wisely, that since the strings of today will stand the strain of tuning to the present concert pitch at the longer scale lengths, the player with the small hands must either seek an older guitar or learn to stretch the webs between her fingers until she (for the small hands are usually those of a woman) can span the stretches imposed by a scale length of 65 cm., or 26″, the standard recognized today as the optimum. Guitars of the late Victorian era found in Britain, incidentally, usually have a remarkably short scale length: 25″ and even less is quite common. Was this not probably so because the guitar at this period was of the drawing-room accomplishments of the elegant young woman?

FINGERBOARD AND NECK (fig. 2)

In fingerboards and necks, also, guitars have always shown a great variation. The luthiers of the Elizabethan age understood the necessity for a fingerboard of a width sufficient to enable a finger placed on, say, the second string, to remain there whilst the first and third strings were vibrated, and that the strings had consequently to be so far apart that they did not rasp against the adjacent fingers, though some of the width was needed to accommodate the double stringing. The eighteenth-century guitar, therefore, usually had a fingerboard of adequate width. But the Victorian age brought a deterioration; the instrument was less seriously viewed, was a social rather than a musical accomplishment, and the players fell into slovenly techniques, such as the holding of the neck of the guitar in the crook of the left thumb. This position makes it impossible for the left hand fingers to stretch across a wide fingerboard,

and the consequence was that the young women of fashion demanded a guitar with a narrow fingerboard, which they could encompass with their small hands and inadequate techniques. But Madame Sidney

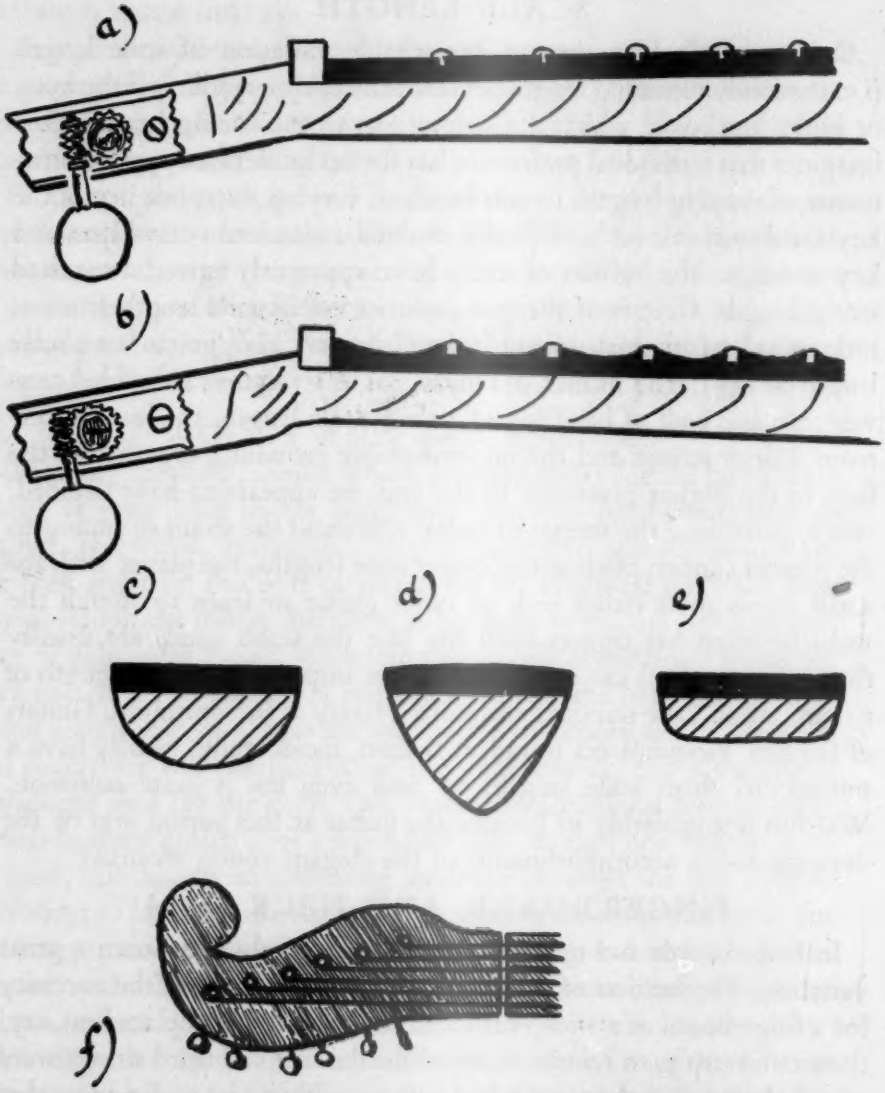

Fig. 2. *a.* Flat fingerboard. *b.* Scalloped fingerboard. *c.* Standard neck (section). *d.* 'Martin' neck with oval fingerboard. *e.* 'Mozzani' neck. *f.* Head of guitar made by Georg Stauffer (Vienna, 1830)

Pratten, professor of guitar at the Guildhall School of Music, London, who put her mark of approval to many guitars of the later Victorian era, notably those of Streiff Misner, must have exercised a good influence against these malpractices, for one has never seen a guitar bearing her imprimatur whose fingerboard is excessively narrow.

Even so reputable a luthier as Charles Frederick Martin of New York, whose guitars are acknowledged the finest made outside Spain in the last century, pandered to this fashion by designing some of his guitars with a fingerboard width of just over $1\frac{3}{4}''$ and a neck whose section was a letter V, to fit into the crook of the left thumb. These instruments are very difficult to play by the acknowledgedly correct technique of today, in which the ball of the thumb and the tips of the fingers are the only parts of the player's left hand permitted to touch the guitar; the ball of the thumb finds the ridge of the V-shaped neck most uncomfortable and inconvenient. Other makers, such as Mozzani, went to the other extreme by flattening the back of the neck for the ball of the thumb to rest on, but this reduced its rigidity and is now seldom encountered.

Happily, during the last decade, all reputable luthiers have accepted as standard fingerboard widths a minimum of 2″ at the nut end, and a maximum of $2\frac{1}{4}''$, and this has disposed of the problem of the narrow fingerboard which confronted guitarists in Britain in pre-second-world-war days. The ovaled fingerboard, often used by Martin and Panormo, has also largely been abandoned in favour of a flat-topped shape. The oval shape also pandered to the less secure techniques of the past, when the first finger could not be held straight in the grand barré.

FRETTING (fig. 3)

In the early part of the nineteenth century there was a certain vogue, which persisted into Victorian days, to dispense with raised frets and to cut and rasp out the fingerboard in a series of waves, the crests of which coincided with the positions in which the frets were normally found. In many instances this wave-form was combined with ivory or metal frets, which were inset into the crests of the 'waves' so as not to protrude beyond the surface, but to prevent, by their harder consistency, the strings from wearing grooves in the ebony or rosewood fingerboard. These scalloped fingerboards, as they are named for want of a better word, are very pleasant to play upon, and the glissando and portamento, effects then much used in certain kinds of music, are easier performed than upon the normal flat, fretted fingerboard. But there is no point between the wave-crests at which the left-hand finger may trap the string, so that in difficult works the player has a sense of insecurity. The pitch of the note is definitely changed if the finger should happen to fall in the trough of the wave, so to speak; and there is excessive wear upon the wound basses because the strings are constantly dragged to and fro over the wave-crests by the pressure of the

fingers. Scalloped fingerboards, therefore, have apparently been finally abandoned by luthiers.

The practice of veneering the back of the neck and the heel with ebony or other hardwoods is also now obsolete, probably because of the cost of such processes in these days of higher living standards amongst skilled craftsmen.

It was a common practice of the eighteenth century to fret the guitars with solid ivory or ebony frets of oblong section, with the sharp edges rubbed down where they encounter the left hand fingers. The frets were let into the fingerboard up to the body, but in most instances the

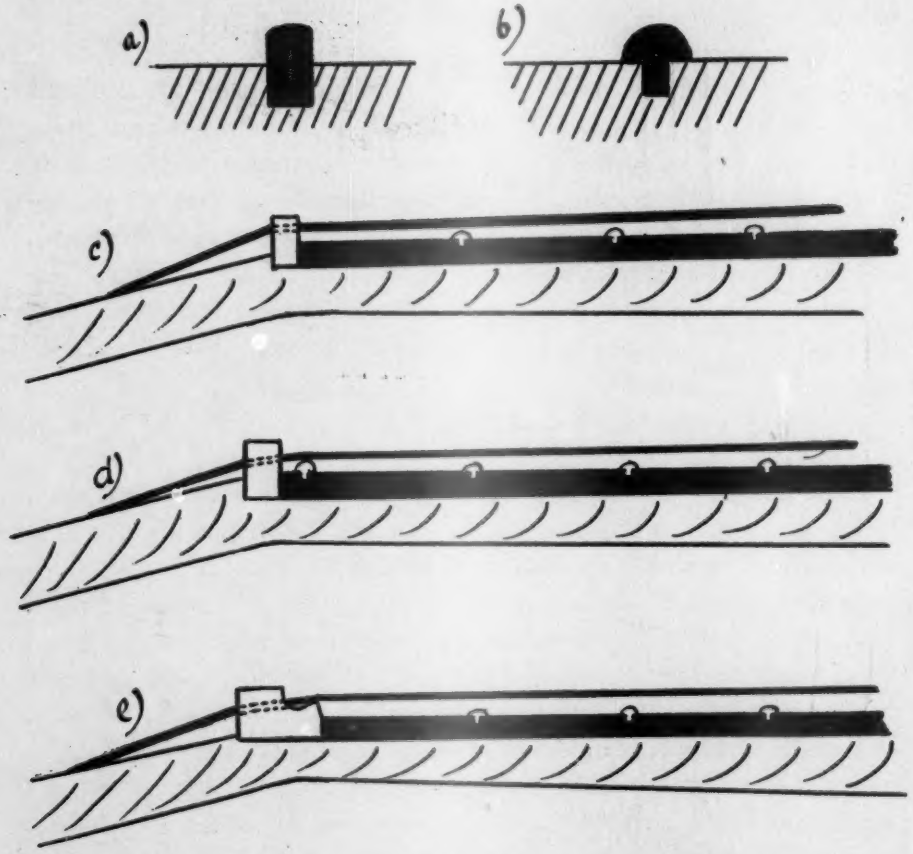

Fig. 3. *a.* 18th century fret (section). *b.* Modern fret. *c.* Standard nut. *d.* Improved double nut. *e.* Roccia-Essex nut.

fingerboard did not extend over the body, but ceased at this point. From the body junction up to the 18th fret, if fretted as far as this, the frets were also of ivory or ebony of square section, glued to the table of the instrument.

The next development was the extension of the fingerboard in one

piece past the junction of neck and body, right to the soundhole. This was an important development, since a fingerboard of ebony, often a quarter-inch thick, is a significant factor in strengthening the whole arm and upper bout of the body against the string tensions and in allowing heavier strings and a longer speaking length to be used. In the early years of the nineteenth century, the use of ivory frets gradually died out, and the instruments were fretted with oblong-section brass fretting, let into the fingerboard to half the depth of the fret along the whole length from nut to soundhole.

Finally, the tongued fret was introduced. This is drawn through a series of dies to the required shape in the form of a continuous wire; the upper flange is of half-oval section, with a thin tongue protruding from the lower surface for embedding in the fingerboard. This wire fretting does not have any sharp edges to cut the strings or abrade the fingers, and its exact method of manufacture enables any fingerboard which is accurately surfaced, to be accurately fretted without the necessity for drastic rubbing-down afterwards to level off the tops of the frets, thus preserving the half-oval smoothness of the fretting to the player's touch. There is still some controversy as to the best width for a fret: narrower frets are said to give more precise intonation and a clearer tone, but wider frets are claimed to give more volume and not to cut into the strings so rapidly. One would prophesy that the wider frets will survive.

The wide bone fret nearest the tuning machines, known as the 'nut', has the dual primary purpose of holding the strings the required distance apart and the required height above the first fret. There has from time to time been advanced a theory that no one nut can satisfactorily combine both functions and that two end frets should be provided to a guitar, one of ivory to space out the strings, and another of metal set immediately in front of the ivory fret, to hold the strings the correct distance above the fingerboard. It is true that there is great difficulty in so cutting the slots in the ivory nut that it will serve both purposes, but despite this, the alternative method of bone and metal fret combined has never really secured wide adoption by luthiers. One can see no basic objection to the improved method, and suspects that natural conservatism is at the root of the objections (not a bad thing, either, in a maker of musical instruments). One luthier, Marco Roccia of Clifford Essex Ltd., has ingeniously combined the two types of nut by cutting from one piece of ivory a double nut, the back of which is the spacer-bar, and the front the level-bar (fig. 3). This nut is most effective in practice, and is an advance on all other types. One wonders why it is not universally adopted.

The standard method of laying a guitar fingerboard is so to make and fit it that its top surface is an exactly flat plane from end to end, so inclined that the strings gradually rise from the nut to the bridge in such a slope that, no matter where fingered, the strings can vibrate with maximum intensity without rattling upon the frets. Experiments are now proceeding with slow-motion photography to confirm a theory that the strings do not vibrate with consistent intensity at all points along their length; Edgar Mönch, a leading German luthier, claims that he has proved this theory, and is now building guitars with fingerboards whose surfaces are a complex series of minute rising and falling curves so as to give at every point upon the fingerboard the smallest possible clearance compatible with freedom from the strings jarring upon the frets. But for all practical purposes, the straight fingerboard remains, one believes, the most satisfactory.

The method of setting the positions of the frets, at one time based upon rule of thumb, or upon the divisions of the diatonic scale as applied to any one string—and reasonably accurate only in a few adjacent keys—has now been superseded by systems based upon the application of harmonic lengths or upon mathematical formulae which enable the frets to be set at regularly graduated and regularly diminishing distances apart, in order to produce a scale in equal temperament comparable with the intervals obtained on an equally-tempered keyboard instrument. (The methods, mechanical and mathematical, used to secure this result are too lengthy to describe here, but they might well be deferred to a later article, should the subject be of interest to readers of this JOURNAL.)

ATTACHMENT OF NECK TO BODY AND HEAD (fig. 4)

The method of joining neck to body is of some significance not only in the durability of the instrument but also in the quality of its tone, since the string tension pulls the head towards the body and the body towards the head, and as the hardwoods of neck and ribs are not compressible, the whole structure tries to fold up, with the hinge of this movement at the spot where the neck and body join. Even in the best instruments there is an appreciable movement about this axis when the strings are brought up to tension, so that they then lie a few thousandths of an inch higher from the fingerboard than when the instrument is first strung slackly. Where there is any defect in the method of securing neck to body, or where the workmanship is faulty, the weakness shows itself over the years in a gradual movement of the neck in its angle to the body, so that the string height above the finger-

board becomes progressively greater, and the bridge saddle has to be lowered to compensate—with detriment to the tone and volume of the instrument since the leverage is reduced when the bridge height is reduced.

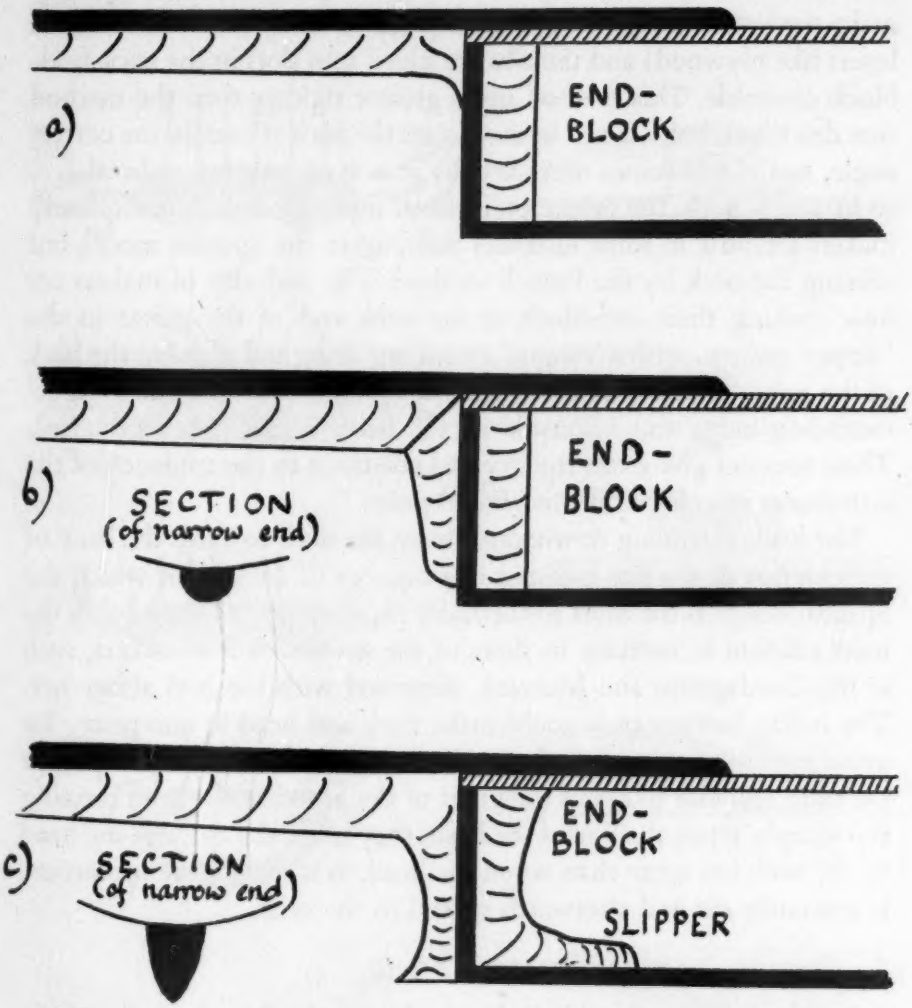

Fig. 4. *a.* 'Mozzani' heel. *b.* French heel. *c.* Spanish heel.

Guitars made in Spain, or to the Spanish pattern, differ at this point from those made to the Scandinavian, German or French and Italian patterns. In the latter, in many instances, the body is built with end-blocks at both ends, similar to violin end-blocks. The neck is then attached to the body by a flat glued joint, or less frequently by a dove-tailed joint, especially if the neck is detachable, in which case the joint is not glued, but is secured by a threadscrew and key which passes through heel and end-block. If the neck is detachable, the fingerboard is

secured to the neck but free from contact with the belly of the guitar, so that it may not rattle when the belly vibrates. If the neck is permanently secured, the fingerboard is glued to the belly as well as to the neck, giving a more secure structure than the best detachable design can afford. On the other hand, makers of the Spanish model frequently make the heel and end-block in one piece (or in a series of horizontal layers like plywood) and the ribs are glued into slots in the neck-heel-block ensemble. This method gives greater rigidity than the method first described, but it is not so easy to set the neck at exactly the correct angle, and if it becomes necessary, by reason of warping or breakage, to fit a new neck, the operation is much more difficult. Consequently makers are now in some instances building to the Spanish model, but affixing the neck by the French method. The majority of makers are now making their end-block at the neck end of the guitar in the 'slipper' pattern, with a 'tongue' extending along and glued to the back of the guitar for three or four inches, and sometimes a second 'tongue' extending along the underside of the belly below the fingerboard. These tongues give extra rigidity and resistance to the tendency of the instrument to collapse at this pivotal point.

The heel, extending downwards from the neck towards the back of the exterior of the ribs is found in a number of designs, of which the Spanish design is the most aesthetically pleasing as well as probably the most efficient in meeting its share of the stresses. A few makers, such as the Guadagninis and Mazzani, dispensed with the heel altogether. The Italian luthiers commonly make neck and head in one piece. To avoid the use of excessively large blocks of wood from which to carve the unit, and also to avoid the grain of the wood in the head running too sharply across the line of the head, they make the angle of the head to the neck less acute than when the head, as is the common practice, is separately cut and afterwards spliced to the neck.

BRIDGES (fig. 5)

The bridge of a Spanish Guitar is always glued to the belly of the instrument; there is no separate tailpiece. But a significant change in bridge design occurred towards the end of the eighteenth century. The bridges upon eighteenth-century guitars were basically (disregarding the ornamental side arms, which often extended right across the belly) a rectangular block of hardwood of the general shape of a railway sleeper, through which, from back to front, were drilled holes for the strings at approximately half the total height of the bridge above the belly, one hole to each string. This method gave the player a rather arbitrary choice of two string-heights according to the manner of

securing the strings to the bridge. The first method was to pass the string through the bridge from soundhole side to tail-end side and there to knot the string: this gave the string a bearing on the lower side of the drilled hole, at half the height of the bridge, and the lay of the fingerboard was so arranged that this position kept the strings very close to the frets for a player of weak touch, e.g. a woman or a casual

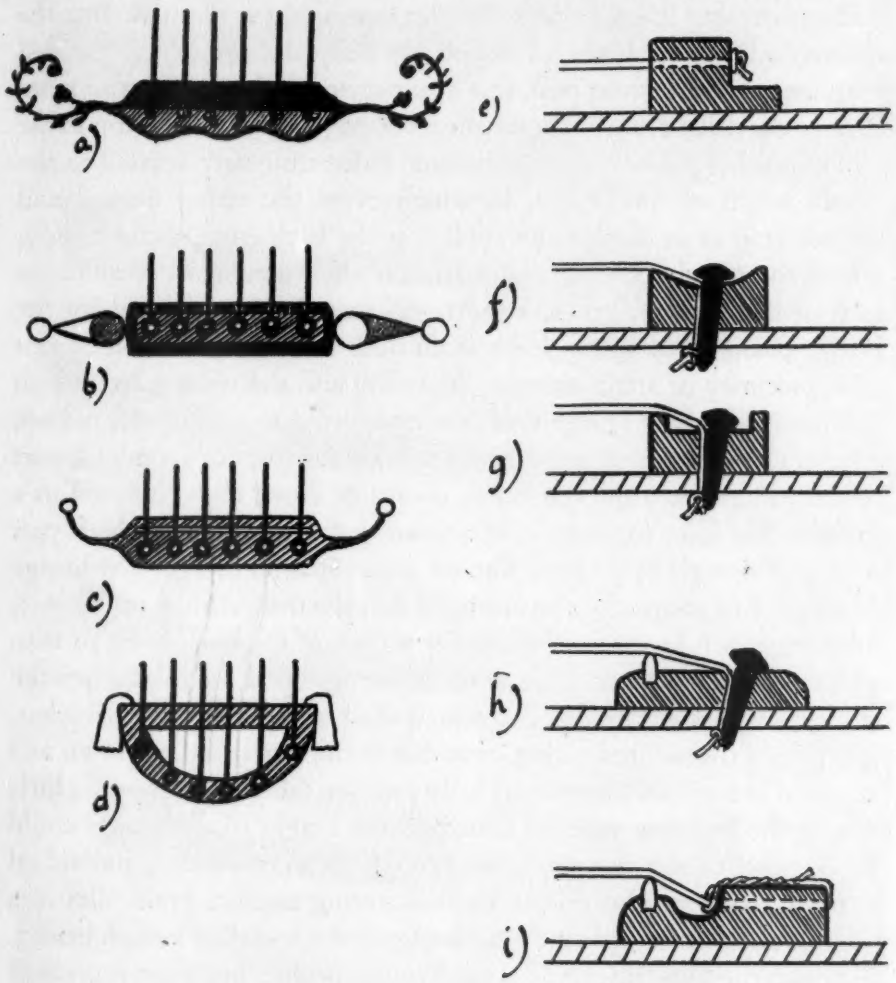

Fig. 5. Bridges: plans
a. 18th century
b. 'Panormo'
c. 'Lacote'
d. French

Sections
e. 18th century (entirely ebony or rosewood)
f and g. 'Panormo' (ebony or rosewood)
h. Lacote' (ebony body, ivory saddle fillet)
i. Modern 'Spanish'

player. For the professional or habitual player with a strong left hand, the second method of securing the string was used: the string was passed through the bridge from tailpiece side to soundhole side and there knotted: the free end was then passed over the top of the bridge and thus over the fingerboard up to the tuning peg. This gave the string a bearing upon the upper surface of the bridge, and thus the strings lay further from the frets so that they could be struck vigorously without causing them to rattle on the frets as they vibrated. But the system had the disadvantage that as the belly and the bridge twisted with the constant string pull, the string ceased to bear upon the front edge of the drilled hole, or upon the front edge of the bridge-top as the case might be; the bearing thus became indeterminately applied to the whole width of the bridge, in which event the string buzzed and rattled, or it even came to be applied at the back edge of the bridge, which completely upset the intonation of the instrument. Around the turn of the century, bridge design was accordingly modified by the bridge being made much wider from back to front (with consequent added security of attachment to the belly) and the oblong bar which had been the whole bridge was then transferred to the tail-end or back edge of the bridge, so that there was room at the front or soundhole part of the bridge for a fillet of bone, ebony or ivory to be inserted in a groove, the fillet forming a firm bearing for the strings which pass over it. This style of bridge is known as the Spanish bridge. The bridge design was of course then so arranged that the drilled holes in the back bar were much lower than the upper surface of the bone fillet, so as to give considerable down pressure of the strings upon the fillet when the strings were under tension. The principal advantage of this bearing bar, apart from the secure bearing, was that as the guitar settled down and assumed its final neck angle and belly position (all guitars 'move' a little during the first few years of their life) the height of the strings could be changed to suit the new positions, or to accommodate individual tastes in string height, simply by substituting another bone fillet of a different height. A variant of this bridge is the so-called French bridge, in which the bone fillet is as in the Spanish bridge, but there is no back bar; instead, holes are drilled through the bridge and belly of the guitar, one to each string, and the knotted ends of the strings are secured into these holes by the insertion of bone, ivory or ebony pins or skewers.

In instruments being built in the mid-twentieth century, the Spanish bridge has superseded the French bridge. One might add that today's bridges have abandoned superfluous ornamental shapes, and apart from occasional coloured wood inlays are soberly rectangular blocks designed

PLATE I

Left to right: The Cusworth Hall guitar, *c* 1790; guitar by Roldan 1797; by Pages, 1815; by Perfumo, 1847; and by Petersen, 1955

PLATE II

Clifford Essex Guitar, 1953

Reproduced from A. P. Sharpe, *The Story of the Spanish Guitar*, by permission of the Clifford Essex Music Co.

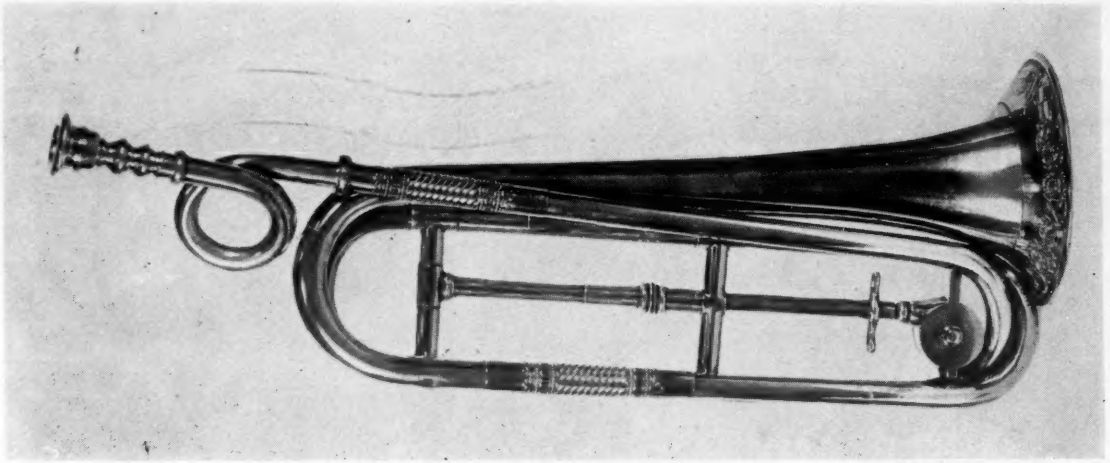

PLATE III

THE REGENT'S BUGLE?

Height from end of mouthpipe to bell edge, 12¾ in. Diameter of bell, 4½ in. Maximum slide extension 2½ in. Effective length of E♭ crook (here shown), 9 in.

PLATE IV

Trumpeters and Kettledrummer. Anonymous German engraving, eighteenth century (see p. 78)

to perform their function in the most efficient way possible. The size of bridges has increased in conformity with the general increase in body sizes, but the weight, proportionate to the area of the belly, remains the same: it is the thinly cut 'arms' of the bridge which have been extended, not the solid body of the bridge.

ORNAMENT

It is difficult to deduce any logical pattern in the changes in ornamentation of guitars during the period under review, since there has always been such a wealth and variety of ornament in appliqué hardwoods upon the belly as part of the bridge design, in rosettes over and around the soundhole, and in inlays on ribs, back and head. One would say, however, that with the increasing sobriety of male attire, the guitar has gradually lost its adornments; would there not be a connection as well as a parallel? The ornamenting of guitars, particularly with mother-of-pearl, reached its zenith in late Victorian times. The writer owned at one time a *guitarra de concierto* by Antonio Carlos Garcia, one of the few true concert guitars made by that maker, who normally made instruments of a cheaper grade, with flat bellies, for casual use. This A. C. Garcia concert guitar was of the largest concert size and the ribs and belly were almost completely covered with ornate mother-of-pearl inlay of superb craftsmanship—but the total effect was in the most dubious taste. As the guitar in recent years has become more and more seriously regarded in musical cricles, so has its ornamentation dwindled until one now finds that guitars by the best makers bear no more ornament than an inch-wide band of purfling of inlaid coloured woods round the soundhole, and stringing in a contrasting colour at the edges of the table, ribs and back.

STRINGS

The greatest disadvantage of the Spanish guitar until the present decade—a disadvantage so severe as to deter most people from taking up the guitar as a professional career—was that the gut treble strings, imperative (as distinct from steel strings) for producing a mellow tone suitable for the interpretation of serious music, would not stand in tune, were frequently false in vibration and so could not be accurately tuned. They constantly broke, and even when a perfect string was fitted and manoeuvred with much patience into proper tune, it would not be many days, or even hours, before the gut began to fray and abrade under the nails of the player and the hard fretting of the fingerboard.

Moreover, the lower strings of deeper pitch, which must be wound

with copper wire to increase their mass, were wound upon silk floss, the only suitable material then available, and this floss, if it were to bear the tension of modern concert pitch at an adequate scale length, had to be of such thickness that the resilience and sostenuto of the string were detrimentally affected.

The development of synthetic materials, notably nylon, has changed the whole situation. Monofilament nylon treble strings are now available, accurately extruded and of constant diameter throughout, which give an absolutely true note, will stand in tune indefinitely, and will bear the hardest use over a period of many months without wear or breakage though the tone gradually deteriorates. The bass strings are now wound upon a core of nylon floss, which has many times the breaking strain of silk floss, and the cores of the bass strings may now be made so thin that the strings can vibrate freely, with ample (and sometimes too much) sostenuto.

Other materials are now being tried for strings, and the writer has used a Luron first string, with encouraging results of clearer tone and greater volume. Doubtless as these synthetic materials are perfected in greater numbers, the ideal one will emerge. Meantime, such is the suitability of nylon stringing that the guitar is now accepted as a fully practicable instrument for a professional career in music, and is offered in the Royal Colleges of Music in Britain as a second study when desired.

VARNISH

There has been no significant change in either the materials or the methods of varnishing fretted instruments during the period under review. The question of varnish and its application to the guitar and mandolin was exhaustively reviewed by the American experimental luthier Harry Garmont in the *B.M.G. Magazine* (see bibliography) in the issues of February and March 1952, and by the British authority John W. Duarte in the *Guitar Review* (New York) No. 12 (1951). Brushed on oil varnish over a sealing coat of white of egg is favoured by many leading makers. Others use french polish, rubbed on.

MEANS OF TUNING

As the watch-key-and-lever type of tuning has apparently always been confined to the cittern and the Portuguese guitar, one may conclude that there have been only two traditional methods of tuning the Spanish guitar: by wooden pegs (as with the cello) or by tuning machines (as with the double bass). These two methods are still in common use, and there has been no significant change except in emphasis: at the end of the eighteenth century nearly all guitars were tuned by pegs,

whereas today, nearly all *guitarras de concierto* are tuned by machines, and only the *guitarras flamencos* are tuned by pegs. (The flamenco guitar is a lighter-built instrument, usually with back and sides of apple or pear wood, made to produce a brilliant, hard tone for accompanying *flamenco* singers and dancers.) Pegs are used on the flamenco guitars, one concludes, not only because they are cheaper (the flamenco guitar is an instrument of the people) but also because they are lighter in weight; the heavier metal machine tuning head would not balance with the lighter weight of the body of the flamenco guitars, and the head would tend to fall when the instrument is balanced upon the performer's knee. The style of head favoured on the Continent, shown in fig. 2f., with all the tuning buttons on one side and with the machines enclosed by a back plate (usually engraved), has died out; its disadvantage was that the buttons were too close together.

BELLY DESIGN

The writer has not yet seen a guitar built before 1800 with a belly which has been built upon the principle of the arch, so as to add to its strength without increasing its weight or detracting from its vibrancy. But today, all true concert guitars are built with an arched belly. The arch is imparted partly by cutting the belly wood in two pieces with a join down the centre so shaped that when the edges are pulled together the wood tends to form itself into an arch: partly by gluing lengths of spruce or pine known as bars, or struts, to the underside of the belly whilst this arch is still maintained, so that when the glue is dry the arch is permanently sustained; and partly by thoroughly drying out the wood of the belly during the whole of the manufacture of the guitar, thus shrinking it as much as one per cent—when the instrument is then taken into a normal atmosphere, the shrunk wood expands to its previous size, and the pressure helps to increase the degree of arching or to maintain that arch which has already been imparted to the belly, despite the twisting pull of the strings upon the bridge which tends to collapse the arch.

The sole of the bridge is of course arched to fit the belly, and this arch of the bridge is another factor in maintaining the arch of the belly. Some luthiers, particularly the Italians, save themselves the trouble of these complicated processes by cutting the ribs to such a shape that where they join at the tail end, they gradually widen so that when the belly is attached, a slight ridge or false arch is formed in the belly. But though this performs effectively one of the functions of the true arch, i.e. to stiffen the belly without adding to its weight, a false arch (which is to a true arch as the canopy of St Pancras Station is to the dome of

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St Paul's) hinders the vibration because the stiffness is all along its length, instead of being at the region of the bridge only, where the stiffness is required.

The soundhole remains circular and in approximately the same relative position as it has always been; it is only in the plectrum guitar, or jazz band guitar, that the cello type of belly construction, with bass bar, has been evolved to produce, with steel strings, the hard, cutting tone required for the harpsichord-like 'continuo' rhythm in dance orchestras. The plectrum guitar's steel strings are, of course, struck with a tortoiseshell plectrum, whereas the strings of the Spanish guitar are never of steel, and are struck with the fingers of the right hand.

INTERNAL SUPPORTING BARS (fig. 6)

It is in this field that the Spanish guitar has seen the greatest advances, if one may thus describe them, since the eighteenth century. These advances are not merely an improvement in the internal design; they represent a revolution in the conception of the purpose of the bracing bars within the body of the instrument.

Guitars of the first half of the eighteenth century were invariably braced by bars of spruce or pine—the same wood as the belly—running transversely across, and glued to, the belly parallel with the line of the bridge and at right angles to the line of the strings. It was customary to place one or two such bars between the soundhole and the joint of the body and neck, and either two or three bars between the soundhole and the lower end of the body beyond the bridge. Less commonly one finds an instrument with only one bar to this part of the belly, and that placed about one inch beyond the soundhole, between it and the bridge.

The back, too, was braced by two, three, or four transverse bars, sometimes of pine but sometimes of the same wood as the back and sides, but as there has been no appreciable alteration in the design of the barring of the back, this aspect may be ignored for the purpose of the present investigation.

The below-belly barring of the eighteenth-century guitar had but one purpose: to stiffen the belly against warping and against the torsion of the string pull as applied to the bridge, which constantly tended to depress the belly between bridge and soundhole and to elevate the belly between bridge and tail end of the instrument. If the belly wood was made thick enough to withstand this pull, the tone of the instrument was hard and brilliant and without depth of bass notes; in other words, the upper partials in the tone were favoured by the rigidity of the belly. Only by making the wood of the belly very thin, could depth of tone be imparted by adding the lower partials to the tone. But when

this was done, the belly soon twisted, and the brilliance of the treble tone was lost because the belly was 'soggy' instead of taut. To counteract this, and to provide a belly thin and resilient for good bass tone but also taut and vibrant for good treble tone, the luthiers not only placed a transverse bar just beyond the soundhole (which held the waist firmly

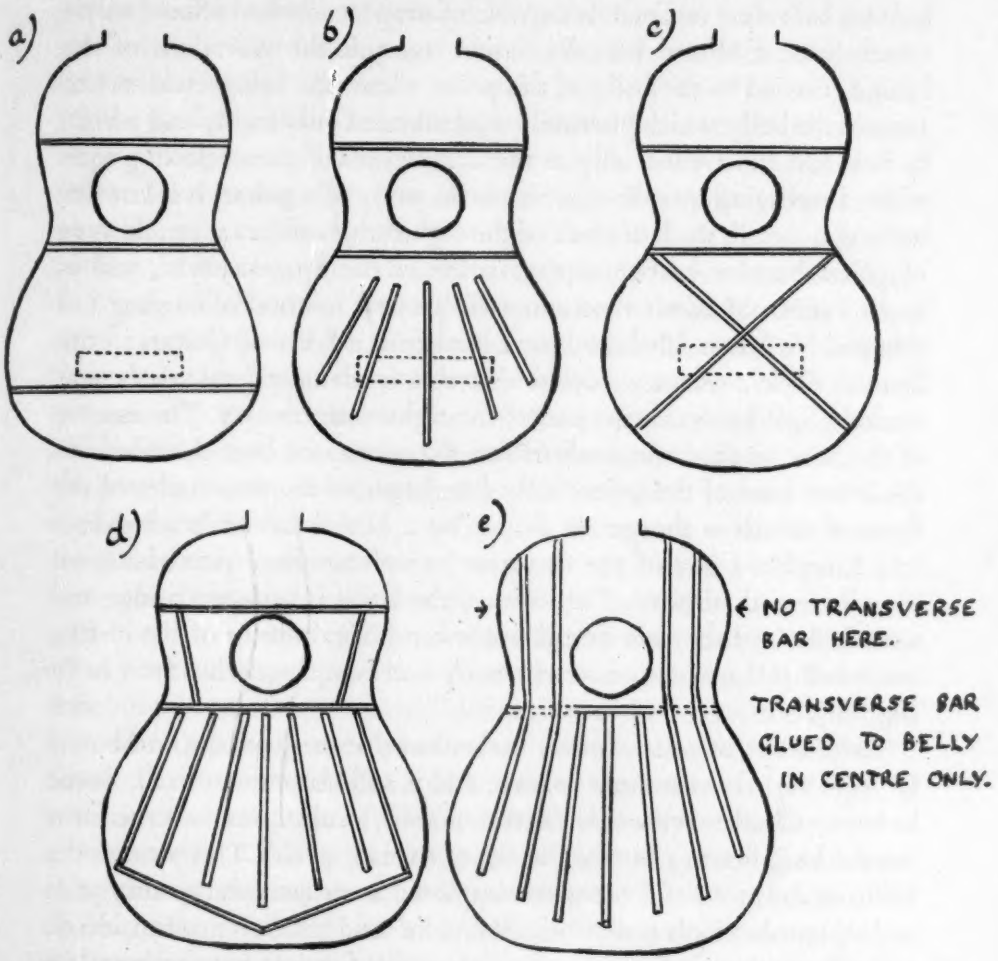

Fig. 6. Barring below belly
a. 18th century. *b.* 'Panormo' in the Spanish style. *c.* C. F. Martin. *d.* Antonio Torres. *e.* Extended system.

and prevented complete collapse) but also another transverse bar just beyond the bridge and, if the body was large or the belly wood very thin, a third between the soundhole bar and the furthest strut. The appended diagrams show the common positions of these bars.

It will be noted that the purposes of these bars were merely to support and tauten the belly and to hold the ribs in position. The bars ran transversely to the length of the body and, unfortunately, tended to

carry the vibrations to the side of the instrument, since those vibrations naturally follow the line of the rib across the belly. The barring, therefore, other than adding tautness and strength to the structure, made no contribution to the volume of tone of the instrument[1].

It is difficult to fix a date to the discovery by luthiers that these bracing bars were not merely capable of support as when affixed transversely but, if affixed laterally, could transmit the vibrations of the bridge (carried to the belly at the point where the bridge was set) to areas of the belly which previously had vibrated only feebly and which, in fact, had functioned only as the completion of the enclosing walls of the amplifying soundbox which is the body of a guitar. It is known, however, that in the latter half of the eighteenth century a certain type of guitar became known as that 'made in the Spanish style', and as Louis Panormo[2] about 1810 adopted this new method of barring and changed his guitar labels to 'Louis Panormo, Maker of Guitars in the Spanish Style', we may assume that this fundamental discovery was made in Spain towards the end of the eighteenth century. The essence of the new method was to distribute the vibrations over the whole of the lower bout of the guitar belly (the larger of the two circles of the figure-8 which is the guitar shape) by a lateral fan of bracing bars which replaced one of the customary two transverse struts between soundhole and tailpiece. The focus of the fan was between bridge and soundhole, and the bars spread out towards the bottom of the instrument so that the vibrations were evenly distributed over the lower belly (fig. 6b).

There were, of course, many variants of this method: the number of fan bars varied from three to nine, and is still not standardized. Some luthiers, Charles Frederick Martin notably, substituted a cruciform interlocking bracing bar for the fan of struts (fig. 6c). This produced a brilliant and powerful tone, but imparted a certain nasal quality such as distinguishes viola tone from violin tone, and which is not considered to be the authentic Spanish guitar tone: this form of barring is still to be found occasionally in the instruments of today, especially if cheapness of production is desired, but its use is dying out.

Just as the design of the violin reached its zenith in the instruments of the Cremona school, so the design of the guitar appears to have reached at least the first stage of perfection in the instruments designed and made by the Spanish luthier, Antonio Torres, in the second half of the nineteenth century (fig. 6d). Torres' instruments epitomized the best in guitar design of their day. To the customary seven fan bars of the Spanish style he added two further bars semi-laterally at the tailpiece end of the belly, and other bars and plates in the region of the sound-

hole, which gave the instrument an unmistakable tonal character of mellow sweetness and power which no other design can reproduce.

It is not the purpose of this article to examine the many examples of unusual guitar design which have been evolved, but rather to examine the mainstream of guitar design which has culminated in the standard *guitarra de concierto* of today as used by Andres Segovia and other leading professionals. Iron bracing bars have been tried; double soundboards; detachable necks; false backs; 'sound chambers' and 'sound funnels' within the body of the instrument; additional bass strings; lute guitars, harp guitars, lyre guitars and what you will; but the professional of today uses conventionally-shaped six-string concert guitars based either upon the standard Spanish fan barring system or upon the modified fan barring of Torres. The standard barring tends to produce a brilliant and lively tone, and the Torres pattern a more subtle and sweet tone of equal carrying power but slightly less apparent brilliance. Players make their choice from personal preference rather than because either pattern is noticeably superior. However, the barring system of the guitar is still the subject of much research, and there has been some advance in the present century in the constant search for greater volume and body of tone for concert work, especially with orchestras, where the tone of the guitar is too easily swallowed up by the general mass of sound, and composers of concerti are correspondingly limited in their scope to antiphonal treatment of the solo instrument or to works with very small orchestral groups. These advances have come partly from researches with modern scientific instruments and by empirical methods into the vibration properties of woods, so that the luthier is able to choose the most suitable pieces of wood for his instruments, and partly from a new conception of the function of the belly of the instrument and its barring. Luthiers and designers in the forefront of research now recognize that the best results will come from a conception of the body of the guitar as a firmly built box whose back and ribs are of themselves sufficiently strong to bear the majority of the stresses to be imposed upon the instrument. To complete the sound chamber, instead of mounting upon the back and ribs a belly whose wood is thick enough to contribute to its total strength, the luthier now attempts to stretch over the top of the body a thin skin of wood which has very little strength in itself, but is supported by a web of bars which perform the dual function of taking the twisting stress of the strings as applied through the bridge and of transmitting the vibrations of the strings to whatever part of the belly the bars may extend.

The first step was of course the adoption of the 'Spanish Style' of construction, with a fan of bars supplemented by several transverse

bars. This was improved by Torres by the addition of two further bars at the tail end, and plates and bars by the soundhole. About 1935 the writer saw a guitar made in Buenos Aires which had advanced beyond this design. It retained the transverse bars by the soundhole, but the bar between soundhole and bridge was arched so that some of the fan bars could pass between it and the belly without touching the transverse bar. This extended the area of vibration as far as the lower edge of the fingerboard, and the tone of the instrument was very satisfactory.

The writer has for the past ten years examined and experimented with guitars, always with the object of discovering a method whereby the lateral barring could be completely abandoned, since this is a barrier to the conveying of vibrations along the belly. One method would be to mount these lateral bars into the sides of the guitar half an inch below the underside of the belly so that the belly is entirely free of contact with them, and so that the fan barring may therefore be extended past the soundhole to the free areas of the belly in the upper (smaller) half of the figure-8 which is the guitar shape. The difficulty here is that the pull of the strings is exerted in two ways: firstly, the strings attempt to pull the bridge towards the soundhole, and secondly, they attempt to pull the neck of the guitar towards the bridge, with the effect that the fingerboard tends to be elevated in its head portion, and depressed in the part between the joint with the body and the soundhole. The transverse bar just by the soundhole, and beneath the terminal point of the fingerboard, is placed there to prevent the belly being sharply depressed here by the pressure of the end of the fingerboard; without this bar, the body would gradually collapse. The problem is to support the lower end of the fingerboard (which is, of course, glued to the top surface of the belly) without interfering with the free passage of the fan barring alongside the fingerboard into the upper bout of the guitar belly, and to dispense with both the transverse bars normally glued to the belly in this region without adding to the total weight of supporting wood within the upper chamber. The whole of the belly of such a guitar would be set in vibration when a string is struck.

THE FUTURE OF SPANISH GUITAR DESIGN

With the carrying of the fan barring right to the topmost part of the belly, the conventional design of the Spanish guitar would reach finality except in minor details such as the proportions of wood thicknesses and the exact dimensions of the various parts. Most of the modern luthiers have been content to copy the designs of Torres, Enrique Garcia, Ramirez and other earlier makers whose designs are accepted as standard; they have been concerned only to make small

detail changes such as wood thicknesses. One British luthier, however —Marco Roccia, who makes guitars for Clifford Essex Ltd., with whom the writer has been privileged to collaborate—recommenced making guitars after the second world war by casting aside all preconceived ideas except those of body size and shape, and, calling upon his experience in repairing some thousands of old guitars by all the world's makers, began again on new lines. The experiments included double cruciform and other unorthodox barrings; barring based on that found beneath the soundboards of early square pianos; barrings without uniformity of structure, placed empirically where the soundboard was proved to be under stress; hollow necks with openings to the body and to the head end of the neck; and variations of wood thickness on treble and bass sides of the belly and sides. One cannot say that any of these experiments produced a guitar superior, overall, in tone or volume to the orthodox instruments, but they did produce guitars which were particularly suitable for particular purposes—e.g. for home playing, for song accompaniment, for the playing of lute music, for broadcasting and recording, and the like—and the selection of designs available to the purchaser gave him an opportunity to exercise his own particular tastes and inclinations, countering the tendency towards greater uniformity of tone which marks the concert guitars of today. Further progress, if any, would therefore seem to lie in an entirely revolutionary approach to the problem. The writer has long advocated research into the building of a Spanish guitar upon the general pattern of the body of the violoncello, not with any confidence that such an instrument would necessarily be superior for general use, but because it might result in a Spanish guitar of such power and tonal depth that the guitar might at last meet the other orchestral instruments on terms of reasonable equality when used in chamber works and concerti. To secure the requisite sostenuto, the soundpost of the cello would be replaced by a 'treble bar' of similar design to the familiar bass bar of cello design. Steel-strung guitars for use in dance orchestras made to this design have been remarkably successful. If an instrument were built to a similar design but with modified wood thicknesses to respond to the lighter strings of the Spanish guitar, it might be the ideal instrument for concerted playing. The writer is now collaborating with the American luthier Harry Garmont, who has already constructed a revolutionary mandolin to this pattern of cello design, and who is now building the first experimental Spanish guitar to cello design. Garmont is well known for his researches into the properties of wood as applied to the building of musical instruments; he uses the finest and latest scientific apparatus for the study of the acoustical properties of instru-

mental sound chambers, and for the choice of woods and the determination of wood dimensions. If, therefore, the instrument now under construction is not a success (and difficulties of right hand technique may arise from the use of a cello type bridge with the strings high above the belly) it may be assumed with some certainty that the now fully developed conventional Spanish guitar represents the furthest point of guitar design which can at the moment be envisaged.

ELECTRICAL AMPLIFICATION

As the structure of the instrument is not substantially altered when a guitar is electrically amplified, one has not dealt with this method of increasing the volume of sound of a guitar for concerted playing. Aesthetically, there seems little objection: harpsichords are now habitually so amplified. The criterion to be applied, one would say, is: Does the *extent* of the amplification so change the nature of the sound that it is no longer delicate and tenuous to the hearer, but becomes akin to an electronic organ? If so, the amplification is incorrect. If not, and it merely allows the guitar to be audible, without markedly changing the tone colour, it is surely acceptable.

One hopes, however, that other means may be found to solve the problem of audibility, as acoustic tone is always subtly more pleasing than electronic tone.

ACKNOWLEDGMENTS

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NOTES

[1] During the era of transverse barring, makers must have realized the limitations of the system, for they tried to make the treble more brilliant and the bass more resonant by setting the transverse barring at angles other than that of a right angle to the line of the strings, with some small benefit to the tone in some instances.

[2] The guitarist José Ferdinand Macario Sor, 1780–1839, in collaboration with the luthiers Louis Panormo and René-François Lacote (one of the Mirecourt group of French instrument makers) was responsible for many improvements in the detail construction and design of guitars of his era, but although Panormo adopted the Spanish fan-bar style, Lacote always remained faithful to the trans-

verse barring, relying on careful choice of wood and superlative craftsmanship to produce his fine guitars. For the most authoritative account of this triumvirate yet written, see Sharpe (see bibliography).

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Note (see p. 9). Since authorities vary in assigning a date to the addition of a sixth string to the guitar, it would be more accurate to refer at this point to the abandonment by luthiers of the habitual construction of guitars having five double strings, than to the introduction of the sixth string.

Canon Galpin, *European Musical Instruments*, p. 100, says that 'the change from the five pairs of strings to the six single strings was coming into vogue in the latter part of the seventeenth century'. But A. P. Sharpe, *The History of the Spanish Guitar*, p. 9, states that 'it was Johann Gottlieb Naumann, guitar tutor to Amelia, Duchess of Weimar (1739-1807) who suggested the addition of the sixth, bass E, string to the guitar' and quotes the book by the instrument maker Jacob Augustus Otto in support of this view. In this book, *Ueber den Bau und die Erhaltung der Geige und aller Bogeninstrumente*, published in 1817 by Reinecke in Halle, Otto writes 'The late Duchess Amelia of Weimar having introduced the guitar into Weimar in 1788 . . . a great demand for the instrument rose. . . . I must here take the opportunity to observe that the guitar originally had only five strings. The late Herr Naumann, Kapellmeister at Dresden, ordered the first guitar with the sixth or low E string, which I at once made for him. Since that time the instrument has always been made with six strings, for which

improvement its admirers have to thank Herr Naumann.' Whilst it may well be that Naumann's advocacy of six single strings spelt the end of the era of five double strings, one is inclined to conclude that the attribution of the sixth string to Naumann alone may refer to its adoption in Germany, since the authority Luis Elorriaga, in *The Guitar Review*, New York, No. 8, 1949, mentions its earlier adoption. In his article, 'The Guitar, a concise history of its origins and early development', appears an illustration bearing the following caption 'Guitar, strung with 5 double and one single string: from the *Syntagma Musicum* by Michael Praetorius, 16th century'. Elorriaga also says 'the celebrated musician and poet, Vicente Espinel (1551-1624) added the fifth string to the guitar but to date no one knows who added the sixth nor when that important improvement occurred. Espinel . . . fixed the ingenious system of tuning which is still being used'. But against this, Sharpe writes (p. 9), 'for a long time historians credited Vicente Espinel as the guitarist who added the fifth string to the four-string guitar, but later research has revealed that Bermudo, writing in 1544 (eleven years before the birth of Espinel) speaks of the five-string guitar'. A footnote to this statement reads as follows: 'Besides playing the guitar, Vicente Espinel was the author of the Spanish novel *The Life of Marcus Obregon, Esquire*, which Le Sage afterwards re-wrote as *The adventures of Gil Blas*'. The chief authority for attributing the invention of the fifth string to Espinel was the dramatist Lope de Vega, and his statement was later endorsed by Nicholas Doisi de Valesco (1640) and Gaspar Sanz (1674) in their treatises on the guitar.

In Russia, during and since the nineteenth century, a seven-string guitar was the standard instrument, and amongst the many variants of the standard six-string Spanish guitar since the eighteenth century have been instruments with additional bass strings which did not extend over the fingerboard and which were mounted upon a separate, or extended, bridge at the body end, and upon a second head or second neck at the head end: these additional strings were played 'open' as fundamental basses in keys for which the normal open basses of E, A and D were unsuitable. A combination of harp and guitar was also evolved at the beginning of the nineteenth century. Many of these instruments are described and illustrated in Galpin and in various articles in *The Guitar Review*, New York. But all have eventually been abandoned in favour of the standard, six-string Spanish instrument. The tone and volume of the guitar are always detrimentally affected, or its length of life is seriously reduced, by the additional tension of the extra basses, and the limitations of the six string instrument lie largely in the technical limits of the performer, composer or arranger using the standard instrument, rather than in its having only six strings. One would prophesy that six strings will remain the standard pattern in the foreseeable future.

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FRANK HUBBARD

The *Encyclopédie* and the French Harpsichord

THE *Encyclopédie ou Dictionnaire raisonné*, edited by D. Diderot and J. le R. d'Alembert, has long been recognized as an important source of information on the history of musical instruments in the eighteenth century. The illustrative plates collected under the heading *Lutherie* comprise the most complete *theatrum instrumentorum* since that of Praetorius. It has only recently come to the writer's attention, however, that the very detailed text describing the harpsichord can be amplified considerably by consulting the several editions and supplements published outside France at various dates after that of the first edition (1751-1772), and before that of the *Encyclopédie méthodique* (from 1782).

In addition to the article *Clavecin*, which appeared in the first edition and which may have been written by Diderot himself, we can now resort to an entirely different treatise under the heading *Clavecin* which appeared in the Geneva edition of 1778, and an elaborate article under *Épinette*, signed 'V.A.L.', in the same edition. The *Table analytique et raisonné*, published in Amsterdam in 1780, consists of a sort of index and guide to cross references within the *Encyclopédie*, and leads us to many short articles, sometimes under subject headings which would not occur to the most imaginative scholar. For example, we are directed to seek further information on the harpsichord under such headings as *Pantalon*, *Emporte-piece*, *Sommier de Clavecin*, or *Crescendo*. The *Supplément* (to the original edition), published in Amsterdam between 1776 and 1777, includes many of the articles culled from the foreign editions, and adds to these, four new plates, one of which shows an upright harpsichord, or clavicytherium. It is natural to include the major treatise, *Clavecin*, by Hullmandel with additions by Framery, which was written for the *Encyclopédie méthodique* in 1791, in any consideration to the contemporary writing on the eighteenth-century French harpsichord. With all these resources, we are able to assemble an impressive body of material which enables a comparison of French building theory with French building practice as exemplified in the few surviving French harpsichords, and the extraction of certain meaningful conclusions.

Of the four primary articles with which we are dealing, two are chiefly descriptive of the contemporary harpsichord, and two are his-

torical. We shall begin by considering the historical articles of Hullmandel and V.A.L., and conclude with the descriptive *Clavecin* from the Paris edition and the *Clavecin* of the Geneva edition.

Hullmandel places the origin of the harpsichord, plausibly, in the fifteenth century, and after skirting the dubious and boggy ground of the more ancient traces of the instrument, finds the original of the type in twelfth- and thirteenth-century Italian clavichords. These were imitated by Germans and Flemmings, and were the ancestors of the harpsichord. Somewhat vaguely, he reports that the clavichord was still in use in the Germany of his day, and that it is a useful instrument for students. In this view, of course, he stands in good company. He complains, however, that the sound of the clavichord tends to become sharp when dynamically augmented. The true lover of the clavichord would find in this tendency the germ of the *Bebung* which is the clavichord's most sensitive attribute. However, the clavichord was never well known in France, and most French writers, including Hullmandel, refer to it from the standpoint of secondhand information.

By the end of the sixteenth century, Hullmandel tells us, the jack had replaced the tangent, and the spinet existed in two general forms, rectangular and harp-shaped. He ascribes the success of jack action instruments to the freer vibration (i.e. greater volume) produced by the quill.

Modern scholarship finds considerable to correct in detail in this account. Italian harpsichords are found as early as 1521, and the typical Italian six-sided spinet, which is neither harp-shaped nor rectangular, had probably appeared even earlier. The vexed question of the exaquier which plunges us back into periods of almost unimaginable antiquity was, of course, completely unknown to Hullmandel.

Hullmandel reports that by his own day virginals no longer existed and that spinets were being broken up so that their soundboards might be used for more modern instruments. This last appears to have been a very ancient practice. The writer has seen a Ruckers harpsichord, dated 1612, in which a row of plugged mortises in the soundboard indicate that the soundboard was made at least partly of material taken from a spinet or virginal.

According to Hullmandel, the earliest harpsichords had two unisons, and Hans Ruckers gave the harpsichord a louder sound by adding a 4′ to the two previous choirs. That the earliest harpsichords had two 8′ unisons seems to be correct, since nearly all the early Italian instruments which have survived are so disposed. However, Van Blankenburg points out that the early Ruckers had only one 8′ and one 4′, even in the two-manual versions, and this is the opinion most

frequently held by modern historians. It must be noted, though, that the very early Anglo-Flemish claviorganum (1579, by Lodowicus Theewes) preserved in the Victoria and Albert Museum seems to have had three choirs of strings.

The strings of these early harpsichords, Hullmandel continues, were partly of brass and partly of iron. In this, as we shall see, he differs from V.A.L. The object of the second manual, he maintains, was to provide nuance by the device of controlling three choirs from the lower manual and one choir from the upper. In this view, Hullmandel reveals his eighteenth-century bias toward expression, as the weight of evidence seems to show that the earliest Ruckers harpsichords used the second manual purely as a transposing device, and that each manual had an identical disposition at different pitches.

Ruckers extended the range to four octaves (*C* to *c'''*) by adding four low notes to the forty-five known before his time, Hullmandel continues. Ruckers is known for the plenitude and quality of his tone, a result of the care with which the wood and the proportions were chosen, and of the graduation he observed in the thickness (of the soundboard) proportional to the frequencies from low to high.[1]

The Italians did not profit by Ruckers' example, Hullmandel observes, but continued to build harpsichords with two unisons and a single manual. He ascribes the conservatism of Italian makers to their preoccupation with the problem of vocal accompaniment which required above all, sweetness of tone. The present writer concurs heartily in Hullmandel's view, since he has always found the peculiarly sweet brittleness of Italian harpsichords most suitable for continuo. Hullmandel lists le Prêtre, Zanetti, le Crotane, and Farini as the best Italian makers. This list probably includes only those names which happened to be convenient, since none of the makers mentioned are particularly well known.

Among French makers Hullmandel prăises Richard. The most eminent maker of the Richard family is Michel (fl.1685). Three instruments survive marked *Richard:* an *ottavina* inscribed *Richard me fecit* 1672, described by Sachs in his catalogue of the Berlin *Hochschüle* collection; another, dated 1693, in the Paris Conservatoire Museum; and a harpsichord showing the Hans Ruckers rose and the date, 1613, is inscribed on the under side of the soundboard *Faict par Michel Richard a Parice Rue du P. . . .* 1688.[2] De Briqueville shows two harpsichords for sale in 1768 and 1780.

An illustrious Parisian maker, François Etienne Blanchet (fl. *c.* 1750), is given more lavish praise. He is supposed to have surpassed Richard and all other of his French predecessors by an agreeable tone and light-

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Ruckers extended the range to four octaves (*C* to *c'''*) by adding four low notes to the forty-five known before his time, Hullmandel continues. Ruckers is known for the plenitude and quality of his tone, a result of the care with which the wood and the proportions were chosen, and of the graduation he observed in the thickness (of the soundboard) proportional to the frequencies from low to high.[1]

The Italians did not profit by Ruckers' example, Hullmandel observes, but continued to build harpsichords with two unisons and a single manual. He ascribes the conservatism of Italian makers to their preoccupation with the problem of vocal accompaniment which required above all, sweetness of tone. The present writer concurs heartily in Hullmandel's view, since he has always found the peculiarly sweet brittleness of Italian harpsichords most suitable for continuo. Hullmandel lists le Prêtre, Zanetti, le Crotane, and Farini as the best Italian makers. This list probably includes only those names which happened to be convenient, since none of the makers mentioned are particularly well known.

Among French makers Hullmandel praises Richard. The most eminent maker of the Richard family is Michel (fl.1685). Three instruments survive marked *Richard:* an *ottavina* inscribed *Richard me fecit* 1672, described by Sachs in his catalogue of the Berlin *Hochschüle* collection; another, dated 1693, in the Paris Conservatoire Museum; and a harpsichord showing the Hans Ruckers rose and the date, 1613, is inscribed on the under side of the soundboard *Faict par Michel Richard a Parice Rue du P. . . .* 1688.[2] De Briqueville shows two harpsichords for sale in 1768 and 1780.

An illustrious Parisian maker, François Etienne Blanchet (fl. *c.* 1750), is given more lavish praise. He is supposed to have surpassed Richard and all other of his French predecessors by an agreeable tone and light-

ness of touch, and we are told that he added four low notes below the Ruckers great C, thus extending the range of the harpsichord down to F'. Similarly, in the treble, he extended the range up to f''' so that the total compass finally reached five full octaves. Blanchet is chiefly known to modern students as the rebuilder of many Ruckers harpsichords and the master of the great Pascal Taskin.

Hullmandel concludes his article with an interesting passage in which he deals with the various attempts of harpsichord makers to achieve the capacity for nuance in the overly rigid harpsichord. He mentions the English 'Venetian' swell and the *peau de buffle* which had been introduced by Pascal Taskin. It seems obvious that, in 1781, the demand for expression had exceeded the limited capacity of the harpsichord and that the period of that instrument's ascendency was closed.

Considerable additional information on the eighteenth century version of the history of the harpsichord can be gleaned from the article *Épinette*, which seems to have appeared originally in a foreign edition of the *Encyclopédie* prior to 1776. The editors of the *Supplément*, published in Amsterdam in that year, are unable to identify the author beyond his initials, V.A.L., and state that they obtained the article from a foreign edition. It is reprinted in the Geneva edition of 1777 but is not to be found in the Livorno edition of 1770. The writer has been unable to consult the Lucca edition of 1758 where it may have originated.

V.A.L. begins by disclaiming knowledge of the time or place of the invention of the harpsichord. One might wish that more music historians had such candour. He observes that two hundred years earlier, the spinet was five feet long by twenty inches in width, and that it possessed about thirty keys and a range of F to c'', two octaves and a fifth. This range seems a bit small to modern students who must judge by surviving instruments, but it must be remembered that the old instruments with the smallest range would have been the least likely to survive.

The action, V.A.L. states, was identical to that of his day except that the jacks carried leather plectra in place of the later quill. This is the only reference the writer has seen which explains the large number of Italian harpsichords which have leather plectra. This type of hard, sole leather is not to be confused with the soft *peau de buffle* introduced centuries later by Pascal Taskin. Taskin's leather produces a very soft sound and was intended as a special effect, while that of the early Italian makers, similar to the leather used by most modern harpsichord makers, is almost indistinguishable in sound from quill. V.A.L. mentions two contemporary makers in Paris who used such leather, De Laine (see

also *Almanach Dauphin*, Paris, 1777) and Pascal. If Pascal is identical with Pascal Taskin, one is unable to explain the obvious lack of correspondence in type between the leather Pascal is known to have used and that found in early Italian harpsichords. V.A.L. states that the jacks of these early spinets and harpsichords had no dampers. This is an improvement so easily made that it is not surprising that no damperless specimens have survived.

The strings, according to V.A.L., were of gut. This is a legend difficult to prove or to disprove. Farini, mentioned by Hullmandel, is supposed to have made gut-stringed harpsichords, and Bach certainly had one, as the inventory of his estate and the description of the instrument by Agricola testify. Throughout the period of the harpsichord veiled and ambiguous references are made to gut-stringed harpsichords, but no instrument which can be demonstrated to have had gut strings is known to the writer. Since the Italian scale was short (ten to eleven inches for pitch *c'*), gut could have been used in any of these instruments in place of brass and steel. The instability in tuning of gut-stringed harpsichords would probably have induced their owners to change to metal strings, and all trace of the earlier stringing would have been lost. About one hundred years before V.A.L.'s time, metallic strings are supposed to have replaced the gut of the earlier instruments, but even in his day one could find old gut-stringed harpsichords in Paris and in the large cities of the Low Countries and of Germany.[8]

The '*épinettes ordinaires*' (the term seems to have meant simply a harpsichord) of V.A.L.'s time seem to have been six feet long by two and a half feet wide, with two keyboards. The upper manual carried one rank of 8′ jacks, and the lower, one 8′ rank and one 4′ rank. V.A.L. does not mention the manual coupler which was standard equipment on Franco-Flemish harpsichords. He does suggest that for little additional expense one could add a fourth rank of jacks close to the nut, which would produce a harp-like sound. This stop appears to be the ordinary English lute stop, in which a separate row of jacks is set in a gap cut through the wrest plank at an angle, very close to the 8′ nut. This device was rare on Franco-Flemish harpsichords, although it was used by Dulcken (Antwerp). Many of the Ruckers double harpsichords originally had four rows of jacks in order to permit two ranks to be used on each keyboard. This was almost a necessity with the early transposing manuals in which C of the upper manual was over F of the lower, and each manual had the disposition, 1×8′, 1×4′. Subsequently, when the manuals were rebuilt in the conventional orientation, makers were unable to find use for the fourth jack. With only three choirs of strings to pluck, the fourth jack obviously could only pluck a string

already provided with a jack. Its new purpose was to produce a variation of the 8′ tone color by plucking the string at a different point or by using another material for the plectrum. Van Blankenburg suggested the device we have seen recommended above.[4]

> 9. All that is necessary to this end, is to give to the fourth jack, which up to now has been an outcast, a more important office than the other three. This may be done by placing it, with its register one and a half or two inches away from the bridge in the bass and as close to it as possible in the treble. If anyone wishes to know what the effect of this will be, let him take a writing-quill and touch a string close to the bridge and then at a distance from it, and he will hear the difference between a spinet tone and a round tone. But that by making such a spinet within a two-manual Ruckers harpsichord one could produce more than a dozen excellent variations of play (as is done by many registers in an organ);—this has been unknown until our time.

Despite all this fanfare, the lute stop never became usual on French four-jack harpsichords. The most common arrangement of such instruments was that devised by Pascal Taskin, who left the four registers side by side in one gap, just as Ruckers had planned them. The front rank was given to the upper manual and plucked an 8′ choir; the three others were carried by the lower manual and plucked the 4′ choir and the second 8′ choir. Sometimes the 4′ rank of jacks was the nearest of the lower manual jacks to the front of the harpsichord, and sometimes it was placed between the two lower manual 8′ jacks. In any case, the rear-most jack always pertained to the eight foot, and always plucked the identical string as the first lower manual 8′ jack. By virtue of the considerable distance of its plucking point from the end of the string, this jack produced the least brilliant tone in the instrument. Taskin exaggerated this effect by using large woolly plectra of buff leather which produced fewer partials and made a real pianissimo available.

The three-jack Ruckers harpsichords did not offer such fertile ground for French invention as the larger instruments, and nearly all are disposed as V.A.L. describes. Occasionally, however, one finds a French instrument with a solo 4′ stop on the upper manual and two 8′ stops on the lower. This is reminiscent of Italian eighteenth century three-manual practice, in which the top manual had a solo 4′, the middle manual 1×8′, 1×4′, and the lowest manual 2×8′. Ultimately the tradition may derive from the practice described by Praetorius, of placing an octave spinet on a larger spinet to provide a second manual.

After suggesting the addition of the buff stop[5] (which he considered to sound like a lute), V.A.L. calls attention to the particular merits of Andreas Ruckers[6] and Jean Denis, of Paris. Two harpsichords by Denis

are advertised (1756) in de Briqueville, and it is possible that Denis is the author of a treatise on the tuning of spinets. No harpsichords by Denis are known to the writer. V.A.L. describes Andreas Ruckers' '*épinettes ordinaires*' as having had three and a half octaves range from *F* to *c'''*.

Like Hullmandel, V.A.L. closes with a long passage in which late eighteenth-century attempts to make the harpsichord more expressive are described. None of these are particularly significant or interesting.

The two distinct articles under *Clavecin* were each reprinted at least once. The first, which we shall designate '*Clavecin I*', appeared in the first edition in Paris of which the pertinent third volume was published in 1753. This article was reprinted exactly in the Livorno edition of 1770. A note in the first volume of that series states that unsigned articles, of which this is one, are to be ascribed to the editor, Diderot.

The second article, '*Clavecin II*', appeared in the Geneva edition of 1778, and was reprinted in the Lausanne and Bern edition of 1782. The plates on *Lutherie* seem to have been omitted altogether from these editions, and there is no direct mention of plates in the article. It seems likely that Pellet, the publisher of the Geneva edition, had the replacement article written since the original would have been unintelligible without the plates. The present writer has been able to consult the Yverdon, 1778–1780, edition, but suspects that it contains '*Clavecin II*', since '*Clavecin I*' seems to pertain to the folio editions, and '*Clavecin II*' to the smaller formats. He has been unable to discover the author of '*Clavecin II*'.

'*Clavecin I*' and '*Clavecin II*' are similar in that both are chiefly descriptive of the contemporary harpsichord and insert historical material only incidentally. Both articles are surrounded by a satellite swarm of supplementary articles, some of which are given in cross reference within the text, and others which are to be found only by use of the *Table analytique* (1780). The compiler of the *Table* is referring to the Paris edition of 1753 plus the four volumes of the *Supplément*, Amsterdam, 1776–1777. The *Supplément* included some of the articles from the foreign quarto editions (e.g. *Épinette*), and therefore these are indexed in the *Table analytique*. Others, however, are not, and it is possible that a certain body of information awaits the scholar who will methodically comb the Geneva edition and its brethren for small articles.

'*Clavecin I*' contains a fairly methodical outline of the procedure to be followed in constructing a harpsichord. There are the errors to be expected from a man who had never actually performed the work, but it is obvious that Diderot, if indeed he was the author, performed con-

siderable research and that he must have paid several visits to the workshop of a harpsichord maker.

The case, Diderot writes, is usually of linden wood, and the corner joints are assembled with finger joints (like the corners of a cheese box) or dove-tails. The bent-side is made of 'trois ou quatre pièces plus ou moins, afin de lui donner plus facilement la courbure qu'elle doit avoir'. This seems to imply a laminated construction such as is used in modern pianos and most modern harpsichords. Most old harpsichords appear to have had bent-sides composed of a single thickness which must have been steamed and bent on a form to produce the curvature. French instruments, painted as they usually were, and with the issue confused by the moulding along the upper edge of the bent-side, are not easy to examine in this regard. It is possible, therefore, that Diderot was correct; and in any case, his is an ingenious suggestion.

The joined sides are glued and nailed to the bottom, and the frame is assembled within the box thus formed. The frame shown in the plate[7] is not possible. Probably Diderot never saw one.

The oak wrest-plank is tenoned into the sides and veneered with pine[8] so as to resemble the soundboard. A separate article, *Sommier de clavecin*, shows the disposition of the holes drilled for wrest-pins. The 8′ and 4′ nuts are glued to the surface of the wrest-plank. Next, the belly rail is inserted. This is the transverse frame member which supports the end of the soundboard nearest the player. In most old instruments it is composed of two planks, arranged one above the other, with a gap left between. Diderot states that if there is no gap, then a rose must be supplied 'pour donner issue à l'air contenu dans l'instrument'.

Some makers use no frame, according to Diderot, but merely increase the thickness of the sides of the case. This has a tendency to mute the instrument.

The soundboard is of Holland pine, perfectly clear and straight grained. The individual pieces of which it is composed should not be wider than six inches in order to avoid warping. The wood should be as good and as old as possible, since the quality of a harpsichord depends entirely upon its soundboard. After the soundboard stock is resawn from thick material and dressed to $\frac{1}{4}''$ in thickness, it should be allowed to season for a considerable period. Finally, the planks are jointed and glued with fish glue, and the board planed and scraped to about $\frac{1}{8}''$ in thickness. The ribs are glued to the underside of the soundboard. The arrangement of ribs shown in the plate[9] appears on no early harpsichord I have seen. Like Diderot's frame, it is probably theoretical. The bridges are glued to the top of the board and it is fixed in the instrument. No 4′ hitch-pin rail is provided on the underside of the

board although Diderot specifies that the pins be driven into the board. Since the soundboard could not possibly withstand the strain of the entire 4′ choir without the reinforcement of the hitch-pin rail, it is apparent that Diderot never saw the underside of a soundboard.

The manuals are coupled by a device known as a push coupler. In this case, the lower manual is drawn forward to couple by grips provided for the purpose on the end blocks, both of which must be manipulated simultaneously. The writer has seen this arrangement in a German harpsichord, but the usual plan in French harpsichords was to move the upper, rather than the lower manual.

An elaborate article, *Clavier*, describes every step in the construction of the keyboards. The procedure is fundamentally identical to modern practice. Linden boards are jointed until a keyboard blank has been formed which has the same dimensions in plan as the keyboard; the grain running the long way of the key levers. The keyboard is marked out on the surface of the blank, the natural key tops are glued on, the holes for the various key pins are drilled through the blank, forming corresponding holes in the keybed which is accurately positioned beneath. Finally the blank is sawn into the individual keys and the sharps are glued on. The article correctly describes the usual French practice of guiding the upper manual keys by two pins, and the lower manual keys by one pin at the balance rail and a rack at the rear.

The nature and operation of the jacks is dealt with in a separate article, *Sautereau*. The jack described is the typical French type, open topped with a plain tongue bevelled at the bottom and sprung from behind with a boar or pig's bristle. The wood prescribed for the jacks is pear with 'white wood' tongues. Holly is probably intended. Some jack making tools are illustrated in the plates.[10]

The registers, or slides, are made of wood veneered with leather. The mortises for the jacks are punched out by a tool described in a separate article, *Emporte-pièce*. Probably the punch cut only the leather, and the wood was cleared with a chisel. The slide for the upper manual is fixed (Diderot is describing a three-jack harpsichord in which only one rank of jacks operates from the upper manual). The two other slides (lower manual 8′ and 4′), are moved by iron levers which protrude through the nameboard.

The lid is of oak or walnut in two pieces, the larger of which covers the strings, and the smaller, the wrest-plank and keyboards. The music desk cannot be folded into the harpsichord, but spans the instrument and is stored when not in use in a drawer built into the stand.

The last step is to string the harpsichord with brass strings in the bass, and steel in the the treble. A table is given in which wire size is

defined in gauge numbers, the smaller numbers denoting large diameters of wire. The stringing is listed from the bass.

GAUGE NUMBER	NUMBER OF COURSES	
Brass		
000	2	The bracketed strings can be of copper if brass does not sound well.
00	2	
0	3	
1	3	
2	3	
3	4	
4	4	
5	4	
Steel		
6 (sometimes 5)	5	
7	5	
8	5	
9	5	
10	5	
11	9 (if the range extends to *e-si-mi*)	
12	Gauge 12 serves in place of 11 in the 4′ choir, and so on throughout the choir, one gauge-number smaller.	

I have been unable to find any definition of French wire gauges but it is possible to estimate the probable size of the various gauges on the basis of practical experiments with old harpsichords. The smallest diameter on a harpsichord is ·009 or ·010″. The largest is not more than ·025″. In view of the fact that fifteen gauge sizes span a change of diameter of about ·015″, each descending gauge number must represent an increment in diameter of about ·001″. On this basis the table can be transcribed thus:

GAUGE NUMBER	DIAMETER IN INCHES	GAUGE NUMBER	DIAMETER IN INCHES
12	·010	4	·018
11	·011	3	·019
10	·012	2	·020
9	·013	1	·021
8	·014	0	·022
7	·015	00	·023
6	·016	000	·024
5	·017		

If the top string is ·009″ instead of ·010″, then ·001″ must be subtracted from each diameter given.

'*Clavecin II*' does not attempt to carry the reader through the construction of a harpsichord step by step, but is content to describe each part of a harpsichord in detail. The general definition of the harpsichord

is that of a stringed keyboard instrument about six and a half feet long, strung with metal; iron in the treble and brass in the bass. The action is carefully described and no plectrum material other than quill is mentioned. The various materials for the separate parts of the harpsichord are specified:

Case	Linden, oak or walnut. (The last is out of fashion since painting began to be done so well as it now is in Paris.)
Soundboard	Clear, old pine [see note 8]. The best comes from Lorraine and Switzerland.
Frame	Pine and linden.
Bridges and nuts	Oak.
Wrest-plank	Hardwood, oak, elm or sycamore.
Keyboards	Linden.
Keytops	Ebony for the naturals. The sharps are topped with beef bone. (Ivory yellows with age.)
Registers	Linden, covered with leather.
Jacks	Pear.
Jack-rail	Elm or linden.

The great skill of a harpsichord maker is seen to be the ability to give his instrument 'un son mâle, fort argentin, moëlleux, et égal dans tous les tons' (a vigorous tone, very silvery, mellow, and even throughout its range). This happy result depends upon the quality of the soundboard, the accuracy of the scale, and the placement of the ribs on the underside of the soundboard. The indicated disposition of these ribs conforms to the system the present writer has seen in many old harpsichords. A large cut-off bar (*boudin*) runs parallel to the 4′ bridge, marking off the right triangle which contains the rose. Each bridge thus lies near the centre of a fairly narrow strip of soundboard sectioned off on either hand by the various structures glued to the under surface. The 8′ bridge is between the bent-side and the 4′ hitchpin rail, and the 4′ bridge is between the 4′ hitchpin rail and the boudin. No ribs cross under the bridges. The 'dead' area beyond the boudin is stiffened by smaller ribs set perpendicular to the spine or straight side of the case.

Great stress is laid upon lightness and equality of touch. Too heavy a touch causes difficulty to the player, too light a touch weakens the tone.

The best harpsichords for tone are those of the three Ruckers, (Hans, Jean and André), and Jean Couchet.[11]. The writer of '*Clavecin II*' feels that no eighteenth-century maker has approached the great masters of the seventeenth century. However, Ruckers instruments 'are useless for today' (1778), partly because of their limited range, but partly also

because the Flemish masters did not make keyboards well. Blanchet is mentioned particularly as a rebuilder of Flemish instruments. His method is to cut both bent-side and spine in order to elongate and to widen the case. The soundboard is pieced out to the new dimension, and the wrest-plank is replaced. Only the soundboard and about two and a half feet of the bent-side remain of the original harpsichord. The replacement keyboards, jacks and registers are much more accurately made than the originals.

The price of a French eighteenth century harpsichord is set at five to six hundred livres, with seven hundred livres the top prices for the very best instruments which approach the Ruckers in quality. These prices correspond to those of the instruments listed for sale in *Les Affiches, annonces, et avis divers*[12] except that there seems to have been more variation than the author of '*Clavecin II*' permits.[13] Some Ruckers instruments sold for as much as two thousand livres, while a harpsichord of Dumont, a good maker represented at present in the museum of the Conservatoire in Paris, was listed at thirty-six livres. A Kirckman was advertised in 1780 at twelve hundred livres, a price which implies that it was more highly thought of than native French harpsichords.

'*Clavecin II*' contains little else of interest to the student of the harpsichord. Tuning is treated briefly; a few words for the clavichord, and the remaining space is devoted to a discussion of the new pianos then coming to Paris from Germany. Bach's famous remark to Silbermann that the action of the piano was too heavy is echoed with a direful prognostication: '. . . mais ils son plus pénibles à jouer, à cause de la pesanteur du marteau, qui fatigue les doigts, & qui même rend la main lourde avec le temps'. German square pianos of this period had a far lighter action than the modern piano. One wonders how Couperin managed his tracker organ without rendering 'la main lourde'.

The harpsichord type which merges from the *Encyclopédie* articles and plates is long and narrow with a painted exterior. The instrument rests upon a cabriol stand. There are two manuals with black naturals and bone-topped sharps, coupled by a push-type coupler. Ordinarily, there are three stops, $1\times8'$ on the upper manual, $1\times8'$, $1\times4'$ on the lower. More rarely, there are four stops disposed: $1\times8'$, upper; $2\times8'$, $1\times4'$, lower.[14] (It should also be remarked that the 16′ stop was never used on Franco-Flemish harpsichords nor is it mentioned in any of the articles under discussion.) All the stops except the upper manual 8′ are controlled by levers just above the keyboards to right and left. The range of the manuals is five octaves, F' to f'''.

This picture can be sharpened considerably by an examination of

existing instruments. We discover that the tone quality of the French and Flemish harpsichords stood midway between the brittle brightness of the Italian and the lush sonority of the English. The sound is quite bright and does not sustain quite so well as that of the English harpsichords, especially in the treble. This produces clarity and articulation in passage work, but makes the French harpsichords less suitable for cantabile arias. The tenor and bass, however, are superbly sweet and noble. This quality explains the great use Couperin made of this register, as for example, in *Les baricades mistérieuses*, or, *Les amusemens.*

Burney reports that the French harpsichord was more lightly quilled than the English: 'The tone of this instrument is more delicate than powerful; one of the unisons is of buff, but very sweet and agreeable; the touch very light, owing to the quilling, which in France is always weak.'[15] The emphasis we have seen laid on light action makes this quite believable. It must not be imagined, however, that these French harpsichords were small in volume of tone compared to modern harpsichords. Their light construction and thin soundboards produced a structure of more resonance than is usual in the heavier modern instruments.

NOTES

[1] The writer doubts that Ruckers observed a graduation of thickness in his soundboards proportional to the various frequencies of the strings. The soundboards he has observed are all of even thickness, or so nearly so that any variation can be ascribed to inaccuracy in planing.

[2] Museum of Art, Rhode Island School of Design, Providence, R. I. See Grove, 3rd edn., *Ruckers*: Hans Ruckers (the elder), No. 14.

[3] I have omitted summary of several paragraphs dealing with the clavichord, the early piano, and a good deal of material drawn from Mersenne.

[4] *Elementa Musica*, p. 145. The translation is supplied by Mr Donald Boalch

[5] A system of pads which partially damps one choir of strings, producing an effect not unlike the pizzicato.

[6] See Grove, *ibid.*

[7] *Lutherie, 2de Suite*, Plate XV, fig. 2.

[8] The European term 'pine' refers to the group of species that Americans call 'spruce'.

[9] *Lutherie, 2de Suite*, Plate XIV, fig. 3.

[10] *Ibid.*, Plate XVII, figs. 13, 14, 21, 26.

[11] See Grove, *ibid.* Hans the elder, Hans the younger and Andreas the elder are those intended. Couchet was a nephew of Hans the elder.

[12] De Briqueville, ed. (See bibliography.)

[13] Of course, the prices in *Les affiches* are those of used instruments, and are naturally less standard than those of new ones.

[14] The two lower-manual 8′ jacks plucked the same choir. In order to obtain two 8′ tones in unison, one had to resort to the manual coupler.

[15] Burney, *The present State of Music in France and Italy*, London, 1771, p. 38.

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1. Paris, 1751–78, 28 vol., folio, of which 11 consist of plates. (Contains '*Clavecin I*'.)

2. Geneva, 1777. 39 vol., quarto, and 3 vol. of plates.

Also Lausanne, 1778. 36 vol., octavo, and 3 vol., quarto, of plates. The supplement, incorporated into the body of the work, includes 6 vol. of tables printed in Lyons, 1780. (Contains '*Clavecin II*' and *Épinette*.)

3. Yverdon, 1778–80. Revised and augmented by Prof. Felice and others. 58 col., quarto, of which 10 are plates.

Also Lucca, 1758–71. 28 vol., folio, with notes by Octavien Diodati.

Also Livorno, 1770. 33 vol., folio.

Supplément: Rey, Amsterdam, 1776–77.

Table analytique et raisonné: Panckoucke, Paris, and Rey, Amsterdam, 1780.

Encyclopédie méthodique, ou par ordere de matières par une société de gens de lettres: Panckoucke, Paris, from 1782. (*Musique*, 2 vol., 1791–1818, contains Hullmandel.)

Note. The *Encyclopédie méthodique* includes verbatim or in précis nearly all of the material in the various editions and supplements of Diderot. Under the general grouping *Arts et métiers*, one finds (vol. IV) an elaborate section, *Instruments de musique*, published in 1785. This begins with '*Clavecin I*' and adds to it a précis of part of '*Clavecin II*' and *Épinette*. Several of the short subsidiary articles on constituent parts of the harpsichord are reprinted.

Hullmandel is found in an entirely different part of the *Encyclopédie méthodique*. Two volumes are devoted to a dictionary of music, and here the various instruments are treated separately. Hullmandel is found under *Clavecin*.

An article of great interest is found under *Forte-piano* in vol. II of *Musique* (1818). We no longer hear Hullmandel's criticism of the piano. All is lavish praise.

J. L. BOSTON

Musicians and Scrapers: an eighteenth-century opinion

THE poem here printed, with its vigorous and amusing criticism of amateur performers, may be left to make its own impact. Explanatory notes can be kept brief. I have taken the poem, with the minimum of alteration (a few misprints and ambiguous punctuation marks) from an anonymous pamphlet entitled *The Dutch Riddle . . . London. Printed in the Year* 1708; the only copy I know of is in the Senior Library of Lincoln College, Oxford (shelf mark DD.3.15). The first six pages of the pamphlet are occupied by the riddle, which is coarse; this poem takes up pp. 7–11. If both sets of verses are by the same man, D'Urfey is a likely guess; especially as the song *O happy groves* seems to have made its first appearance (set by Barrett) in the 1707 edition of his *Wit and Mirth*. The zingle-zingle-whet onomatopoeia in the verse about viol-playing is reminiscent of Purcell's catch *Of all the instruments*. Perhaps too the line 'Blow cuckolds blow' in reference to the Lord Mayor's trumpeters is an allusion to Purcell's *Blow Boreas blow*. The joke about windy instruments is of considerable antiquity. The phrase 'Wapping slurs or graces' is obscure: Mr Thurston Dart suggests that it may refer to public-house concerts held there (as the *Star* and the *Gun* seem to be general rather than particular pub-names); but it may merely be used loosely to imply a clumsy performance, as the noun 'a Wappinger' meant 'a lout' rather later in the century.

MUSICK *Commended, and* SCRAPING *Ridiculed,* etc.

Since *Musick* so delights the Sense,
  And charms each Lover's Breast,
Let us, of all the Instruments,
  Try which will please the best.
Hark how the chearful Violin
  Its Silver Sounds sends forth,
Whose sprightly Notes our Hearts incline
  To Musick and to Mirth.
As the wandering Planets,
  Who never are idle,

The Musical Spheres
In their Motions obey;
Ev'n so does my Soul
At the Sound of a Fiddle
Dance merrily round
Its inclosure of Clay.
Or when it breathes its softer Airs,
So melting, so Divinely sweet,
I could dissolve in Tears and Pray'rs
At charming *Chloe's* Feet.
But when a bold Hand,
With a Grace like a *Bacchus*,
Most manfully Thrashes
The Strings 'till they rattle;
No Beautiful Nymph
With her Charms dare attack us;
The Punk we defy,
And incline to the Bottle.

II

Hark how the Organ next commands
Our Ears with awful Pow'r;
No singing Swans in softer Strains
Foretel their dying Hour.
To Heav'n it elevates the Mind,
And with Devotion fills the Heart;
No Nightingails in Consort joyn'd
Can sweeter Harmony impart.
But when it is touch'd
At the *Star* or the *Gun*,
By some blind begging Bag-piper's
Son for a Devil,
Who does with one Hand
Vamp a Base to a Tune,
Whilst the other is wiping
His Nose from the Snivel;
O! what Musick it yields,
With a tone like a Drum
That would make a Man sick,
Tho' admir'd by some:
Whilst Soldiers and Sea-men,
Boys, Wenches, and Women,

Some dancing like Bears,
  Others lending their Ears
To the Doodle and Squeak,
  Toot a Toot, and a Hum.

III

The Viol's in the Master's Hand;
  The Lyre-Way Tunes he plays
Your Grave Attention will command,
  Whilst with its charming Lays
He does each list'ning Soul delight,
And with his Cadences invite
  Our Tongues to sing his Praise.
    But when pretty Miss
    Slides upon her Knees,
And slips in the Viol between 'em!
    How she scrapes and she sings,
    And bedevils the Strings,
As if nothing but Discord were in 'em!
    With her Trills and her Shakes
    Such a Howling she makes
    That a Consort of Cats
    From her Musick would run.
    With a Finger on a Fret;
    Zingle, zingle, zingle, whet,
When a Squeak up in Alt,
Here a Fault, then a Halt,
    So my Lady has done.

IV

Now, listen to the am'rous Flute,
  You loving Nymphs and Swains;
'Twould make sweet *Philomel* turn Mute
  To hear its softer Strains.
What warbling Notes delight the Ear:
  What pleasure do we find!
What sordid Anch'rite could forbear
The Thoughts of Love, were he to hear
  Musick so charming and so kind?
    But when City Beau,
    Powder'd up for a Show,
Sits behind his Counter a Piping,

With his Musick-Book spread,
Beating Time with his Head,
It would give Man's Guts the Griping.
The Tune that he loves
Is *O happy Groves,*
Which the Dunce so confoundedly touches,
'Till he slabbers his Pipe.
Then he gives it a wipe,
And forbears when his Master approaches.

V

Hark how the Trumpet's Warlike Tone
Tantara rara sounds to the Battel.
Who from its Marshal Voice could run,
Or quit the Field tho' ne'er so fatal?
The bold Heroick Strains we hear,
Were they to reach a Dastard's Ear,
Must sure inspire him to be Brave,
When such a Harmony is nigh.
Rather than like a Coward fly,
Who would not chuse a Grave?
But when the Brazen Trumpet's held
Aloft, at L-d M-r's Raree-show,
The Cheeks like Foot-balls first are swell'd,
Then blow, Cuckolds, blow.
My L-d his Trumpets much commends,
And vows they chear his Heart,
Tho' all this windy Musick ends
In Fart, Fart, Fart.

Chorus

Come, Violins, again begin,
Assisted with our Bases;
No Bungler here shall teaz the Ear
With *Wapping* Slurs or Graces.
O Organ! let thy Heav'nly Sound
Inspire us to perform.
In thee all Harmony is found
That can the Fancy warm.
Come, Viol, soften with thy Notes
The various Sounds we hear.
Assist us all, ye charming Flutes,
To please the list'ning Ear.

That all may in a *Chorus* joyn,
  Sound the Trumpet, sound.
Since Musick is Divine,
  Let Harmony go round.

Grand Chorus

Our Songs and our Musick
  Let's still dedicate
To *Purcel*, to *Purcel*,
  The Son of *Apollo*,
'Till another, another,
  Another as Great
In the Heav'nly Science
  Of Musick shall follow.

CALDWELL TITCOMB

Baroque Court and Military Trumpets and Kettledrums: Technique and Music*

In the Middle Ages, the Crusaders had a long-lasting contact with the civilizations of the East and could not help but there acquire new tastes, desires and customs. Among the novelties that caught their fancy were two instruments, already closely associated, which were to remain almost inseparable for centuries afterwards: the long, straight trumpet, and the small kettledrums known as nakers. Brought back to Europe, these instruments enjoyed special favour for many years. Then, in the mid-fifteenth century the Europeans came to know, via the Hungarians, the large kettledrums of the Ottoman Turks. These drums came into general use, first in Germany and then throughout the rest of western Europe, while their smaller predecessors, the nakers, were gradually abandoned and completely disappeared early in the sixteenth century. The early trumpets and nakers were the prerogatives of the nobility, as they had always been in the East. With the decline of chivalry the trumpet retained its high position; and the newly-imported large kettledrum at once joined with it to take top place in the musical social hierarchy.

THE GUILD

The trumpeters and kettledrummers enjoyed various privileges and rights that differed according to local custom and the whims of the sovereigns. In Germany around the time of the Reformation these rights were sometimes forgotten or disregarded. Consequently the musicians of several courts, led by those of Vienna and Dresden, addressed a complaint to the Imperial Diet; whereupon in 1528 at Regensburg an imperial decree (*Reichsabschied*) that restored their threatened rights was issued by Emperor Karl V and supported by his successor Ferdinand I. The rights were built up throughout the rest of the sixteenth century, and led to the founding, by Emperor Ferdinand II, in 1623, of the Imperial Guild of Court and Field Trumpeters and Court and Army Kettledrummers (*Reichszunft der Hof- und Feld-*

* This article is adapted mainly from Chap. VII of the writer's unpublished doctorial dissertation *The Kettledrums in Western Europe: Their history outside the orchestra* (Harvard University, 1952).

trompeter und Hof- und Heerpauker). The Guild was put under the hereditary patronage of the Elector of Saxony, under whom the members enjoyed special favour.[1]

The position of the Guild was strengthened by the Thirty Years' War (1618-48). In 1630 an imperial decree elaborated on the privileges of the Guild. A formal written statement was issued in 1643 in behalf of the members of the Guild and was signed by 'Hanns Jacob Trompeschka, der Röm. Käyserl. Maj. Hof- und Feld Heer-Paucker,' along with twenty-two trumpeters. A further decree backing up the rights of the Guild was proclaimed in 1650, and yet another in 1658.

The eighteenth century was not to be outdone, and several confirmations of the ancient privileges of the Guild were issued under the Emperors Karl VI, Franz I and Joseph II.

With the end of the Baroque-Rococo era and the start of the French Revolution, the Guild of Trumpeters and Kettledrummers deteriorated, and received its formal deathblow in a decree of Friedrich Wilhelm III issued in November 1810.[2] The Guild could not have continued to flourish, for this would have been incompatible with overall military discipline and with the new democratic ideals that championed unprotected and free competition. Thus ended three hundred years of glory and honour. But the members were conscious of this long tradition extending back to that first imperial decree of Karl V, and in deference to him they continued to be known as *Karoliner* right up to the very end.[3]

Who could employ trumpeters and kettledrummers? The decrees mentioned above took great care to make it clear that these musicians were allowed to serve only in the households of emperors, kings, electors, dukes, princes, counts, lords and others of noble and knightly rank, and occasionally of persons especially qualified, through, for example, the possession of a doctoral degree.[4] The use of trumpets and kettledrums was forbidden to those who were not members of the Guild, such as the city-pipers, tower-blowers, tavern minstrels and other town musicians. Any such persons caught playing the instruments had them taken away and handed over to the Chief Imperial Field Trumpeter (*Reichsoberfeld-trompeter*), and the offenders had to pay a fine of 100 gold florins, half of which went into the Court Trumpeters' treasury. In 1684 and 1694 some city-pipers were discovered in possession of kettledrum and had to suffer the consequences. An extreme case occurred about the same time in Hanover, when it became known that the chief town-musician had a trumpet. While he was practising on it, the Elector's trumpeters broke into his house, grabbed the trumpet and knocked out his teeth with it before

they left. They maintained that they had only asserted their just rights and escaped all censure and punishment.

The trumpeters and kettledrummers were to perform only for the nobility and at the express order of the sovereign or noble who had jurisdiction over them. They were specifically forbidden to provide music at such affairs as middle-class and peasant weddings, annual fairs, festivals, public dances and theatre performances, and the like. Furthermore, not only were the city-pipers prohibited from playing trumpets and kettledrums, but the members of the Guild were not even allowed to play their rightful instruments in company with any non-Guild city musicians. Guild members were exempt from military law, the Guild holding itself responsible for the discipline of its members; and any member caught consorting with town-pipers was severely punished for his heinous crime.[5] The great prestige of the Guild of course produced in its members a violent hatred and contempt for the city musicians, a hatred which the latter returned coupled with an understandably gnawing envy.

It is also easy to see why the city magistrates enviously eyed the trumpets and kettledrums of the nobility, and thought what a wonderful addition they would make for major civic festival occasions and great parades. This addition sometimes materialized. The Guild members regarded such things as somewhat a profanation of their art, but nevertheless, magistrates desirous of having trumpets and kettledrums for pompous affairs sometimes succeeded, upon payment of a large amount of money, in persuading sovereigns to issue for their use an official permit, called a *Trompeterfreibrief*.[6] But these were exceptions to normal policy.

The prestige and pride of the Guild is often manifested in some of the words and phrases used concerning it. For example: the members of the 'closed Guild' (*geschlossenen Zunft*) were usually designated as 'honourable' (*ehrlich*), and they practised an 'exalted art' (*edlen Kunst*) or even a 'noble, knightly free art' (*adelig-ritterlich freie Kunst*); the city-musicians were 'low' or 'common' (*gemeinen*), or 'incompetent good-for-nothings' (*untüchtigen Personen*), and to play with them was the 'very greatest abuse' (*höchsten missbraucht*), through which they would 'grievously disgrace their art' (*die Kunst höchlich verschimpfen*); and finally, one spoke of 'the heroic kettledrums' (*die heroischen Paucken*).[7]

How could one gain entrance to the Guild? Whoever aspired to the privilege of becoming a member first had to pay a fee of 100 thalers and then enter upon a period of apprenticeship under the tutelage of a master of the art of trumpeting or kettledrumming. Not all members

of the Guild were allowed to take on pupils for training. Only those who had served in the field could teach; that is, the plain *Hoftrompeter* were not qualified as were those who had earned the title of *Hof- und Feldtrompeter* or *Hof- und (Feld-) Heerpauker*. The apprenticeship lasted up to seven years. At the end of this time the aspirant had to pass a stiff examination and demonstrate his acquired art in front of a whole regiment.[8] Only then was he taken into the Guild, when he was required on oath to keep his skilled art secret from all non-members. It was a long and rigorous process. Yet so highly regarded was membership of the Guild that noblemen themselves did not consider it beneath their dignity: a duke of Saxe-Weimar went through the necessary training and became a trumpeter in the Guild, while a Prince von Wittgenstein became a kettledrummer, eventually to be considered the finest kettledrummer of his time. Indeed the regular trumpeters and kettledrummers of the Guild held the rank of officers, were authorized to wear the ostrich feather of nobility in their hats, and were provided with horses and grooms (though they did not normally wear armour).

As mentioned at the outset, Germany was the model for the rest of western Europe as regards the treatment of trumpeters and kettledrummers. Although the other countries did not have so elaborate and detailed rules as those which obtained in the Guild in Germany, the practices, privileges, rights and high prestige described above were, with some variations, valid for those peoples as well. In all countries the most magnificent uniforms were provided for the players, the most decorative aprons for the kettledrums and banderoles for the trumpets, the most lavish caparisons for the horses and drum-carriages.[9] All this expense was by no means sheer waste: for the music of court and military trumpets and kettledrums was conceived, and rightly so, with view to its impression on the eye as well as on the ear. Colour, pageantry, spectacle, pomp—these were indispensable.

THE KETTLEDRUMS

This attitude had a great effect on the actual playing technique of the kettledrummers. Indeed the majority of the many contemporary illustrations of drummers show the players with one or both of their hands flung high in the air. It was such a kettledrummer that led the train of the German Baron Fabian von Dohna into France in the mid-sixteenth century; and so annoyed were the French at the Baron's ostentatious entrance that Henri, Duke of Guise, had his kettledrums dashed to pieces 'à sa grand' honte'.[10]

With the advent of Baroque splendour in full force, however, ostentation, often to an extreme degree, became expected of all kettle-

drummers. Mallet emphasized in 1685 the need of 'un beau mouvement des bras'.[11] And five years later we find in Furetière's *Dictionnaire* that 'le jeu des Timbaliers se fait avec plusieurs contorsions de corps & de bras qui paroissent extravagantes'. Zedler in 1735 described a kettledrummer as one who 'knows how to strike the kettledrums elegantly (*zierlich*). This is done with certain movements and turns of the body and hands which elsewhere would seem ridiculous.'[12] In 1738 Eisel wrote that the kettledrummer's hands must be supple and flinging (*schlenckerende*). And so it went on.

The inconographical sources show that the large kettledrums were at first played mainly with knobbed sticks. And in a description of King Christian IV's visit to King James I of England in 1606 we read that in the royal retinue was 'the Kinge of Denmarke's Drume, riding uppon a horse, with two drumes, one on each side of thee horse's necke, whereon hee strooke two little mallets of wood, a thinge verie admirable to the common sort and much admired'.[13]

Soon afterward, sticks terminating in small wooden disks were becoming the commonest kind, and these were standard by the end of the century. Mallet in 1685 described them and rated their tone-production superior to that of ordinary drum sticks:

> To beat upon the kettledrums the kettledrummer uses drumsticks of beachwood or boxwood, each eight to nine inches long and having at one end a small rosette of the size of a silver crown; it is the edge of these small rosettes that strikes the skin of the kettledrum, and makes it give out a sound much more pleasant than if it were struck with a side-drum stick.[14]

This kind of stick, often decorated with precious jewels, remained normal in the eighteenth century, and was described by Eisel in 1738 as ending in a small wheel or disk (*Rädgen*). Eisel went on to say, moreover, that the drum tone could be muffled for such occasions as funerals by covering the skins with woollen cloth, a practice often confirmed in the pictorial sources. As an alternative, however, he said the sticks could be covered with chamois leather, or have woollen balls covered with leather or gauze. (Eisel also prescribed that the drum skins should be only half tanned; and that, for the best tone, they should be smeared when dry with brandy and garlic, of all things, and then dried in the sun or at a good distance from a slow fire.)[15]

We must recall that the Guild of Trumpeters and Kettledrummers in Germany was an ingrown society; that its members were extremely jealous of their art, acquired through long and arduous apprenticeship; and that these members, once admitted, had to take an oath to keep their art a secret. One result of this was that the music of court and

military trumpeters and kettledrummers was for years and years generally not written down, and thus it could not fall into unauthorized hands. The playing technique and the music were handed on by tradition from one generation to another; each student learned by rote from his master, and for the rest of his career played from memory. When the Guild members did not play from memory, they improvised music by embellishing and combining patterns and motives from their large basic repertoire.[16]

Improvisation was a prerequisite and prerogative of the drummers even more than the trumpeters. The military signals were relatively fixed and were of course sounded by trumpets; but it was up to the drummers to supply a more or less undetermined rhythmic bass of their own invention and to adjust their parts to those of the trumpets above. This is borne out in French, German, and English writings from Arbeau's *Orchésographie* (1589) onwards; the kettledrummer was required to know the trumpet signals and marches by heart, and to possess a keen ear whereby he could make the most of the freedom given to his fantasy in excuting his accompaniments.[17]

Most fortunately for us, we can get a concrete idea of what the court and military kettledrummers could and did play from the small corpus of marches for kettledrums alone that have been written down for preservation. Ex. 1[18] shows a very simple kettledrum march of undatable origin which was still being used late in the eighteenth century. It consists merely of two balanced four-bar phrases, which could be repeated *ad infinitum*, preferably with variations.

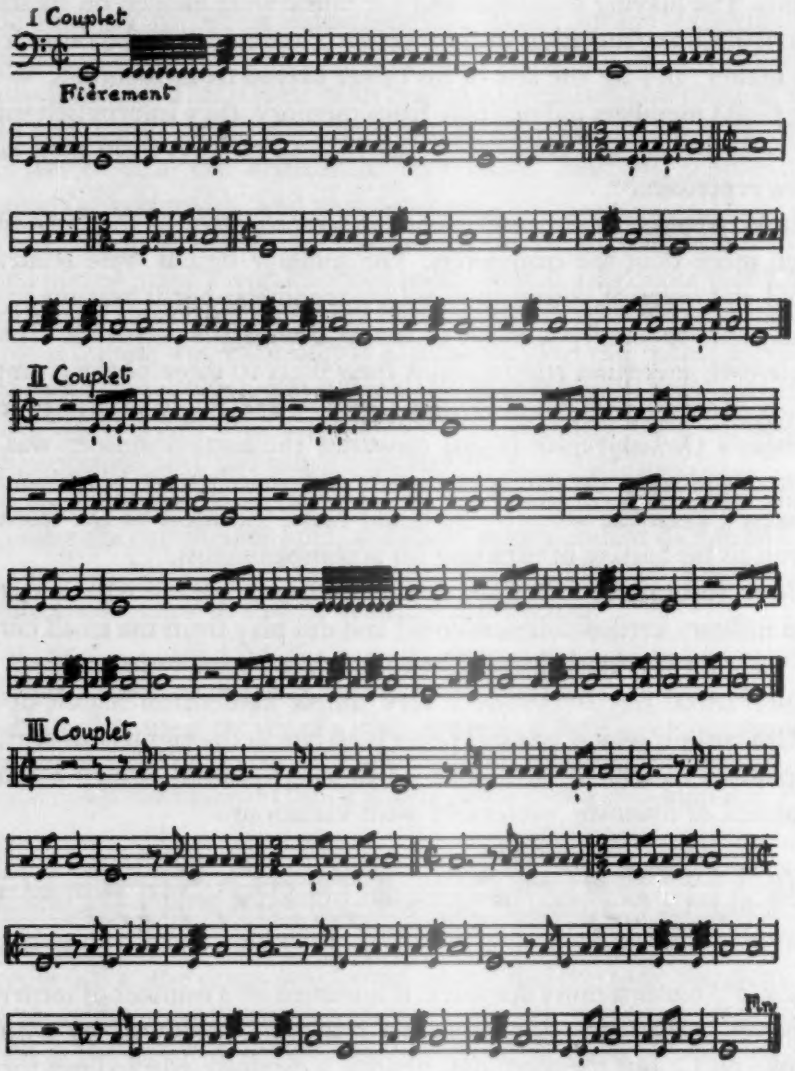
Ex. 1

Ex. 2[19] is much more complex. It is unified by a number of recurring motives, particularly the short fast rolls on G followed by a single stroke on C. But the piece has, besides, a carefully worked out formal organization, the basic scheme being A B A'. Rhythmic squareness is avoided by the variety of bar-groupings in the phrases. The relations among the phrases of the three sections (*couplets*) can be seen from the following scheme of bar-groupings (the 6+8 in the 3rd section and the 8+5 in the 2nd are overlapping):

1st sect.	7+4+6+6+6+6+5
3rd sect.	(1+)4+6+6+6+8+5
2nd sect.	6+6+8+6+8+5

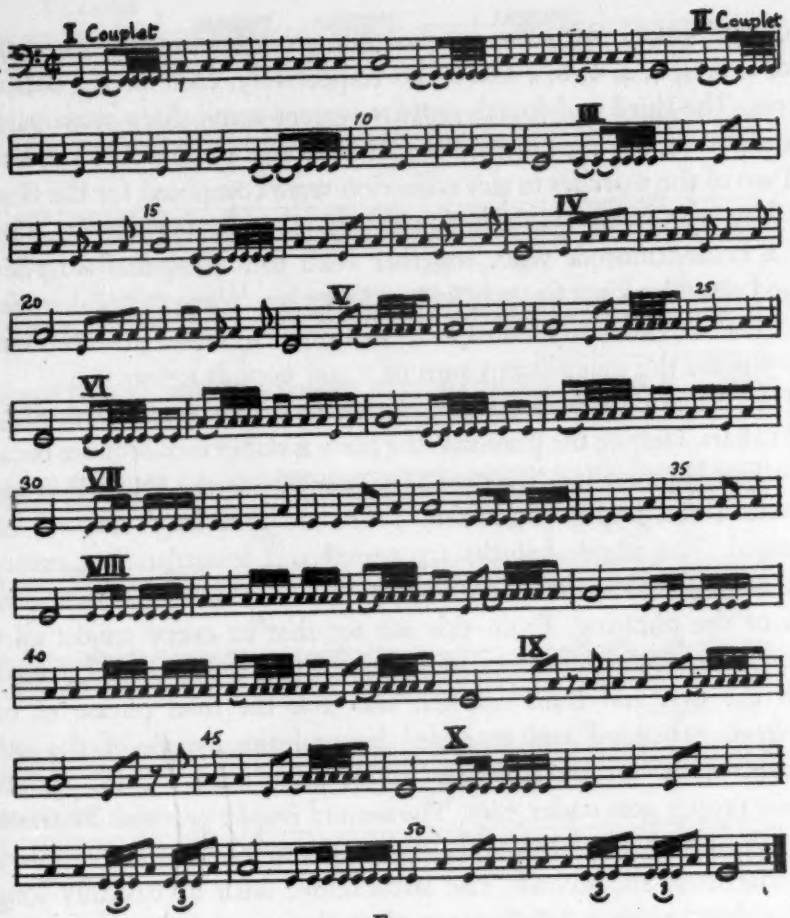
Every phrase with an even number of bars is made up of two equally balanced halves. The first and third sections have changes from duple

to triple metre, but the basic half-note (minim) *tactus* continues undisturbed throughout.



Ex. 2

The most illuminating source, however, is the collection of seventeenth-century marches, carrousel pieces and other court music[20] transcribed in 1705 by André Philidor ('Philidor l'aîné'), librarian of Louis XIV's Royal Music Library at Versailles and father of the famous chess champion. He includes a march, Ex. 3, written by his younger brother Jacques ('Philidor cadet'). (In this and following examples from this manuscript I have, where necessary, modernized the rhythmic notation and the indications for first and second endings to bring them



Ex. 3

Ex. 4

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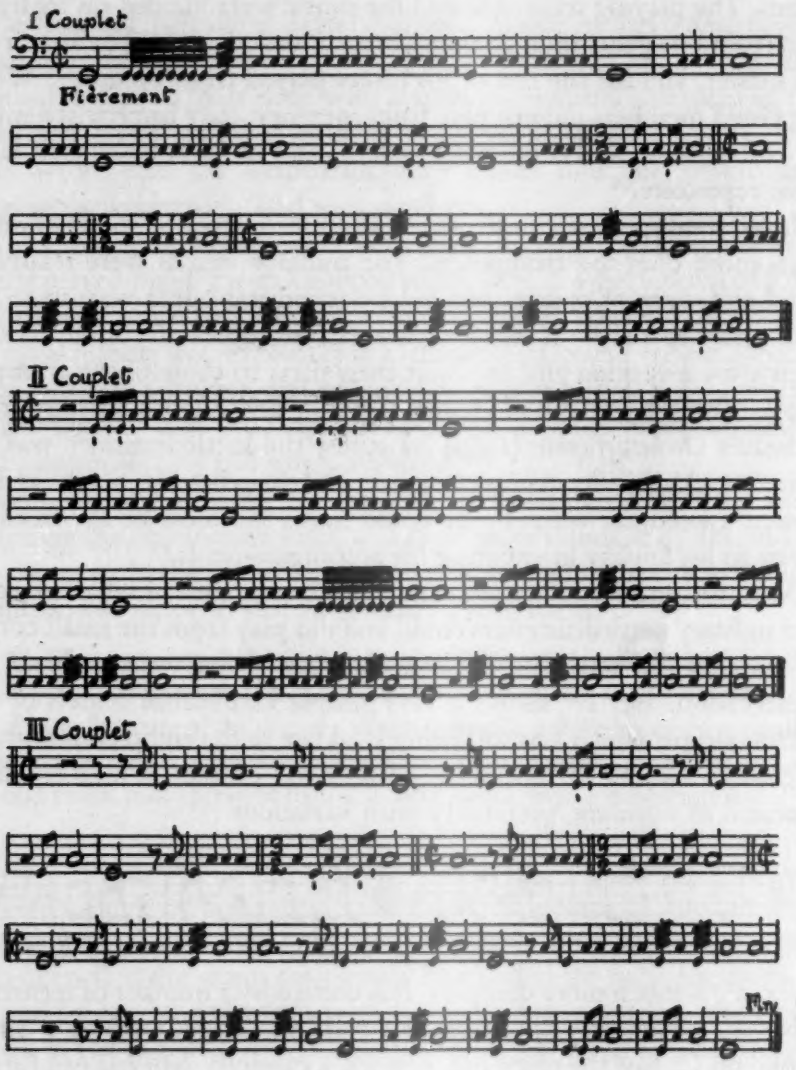

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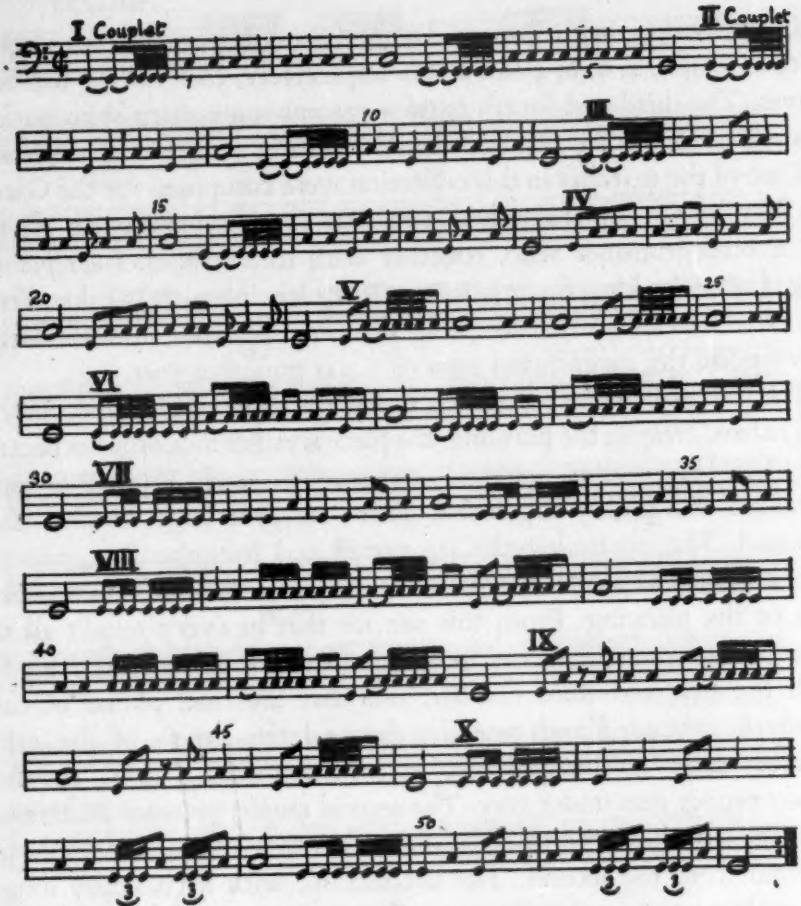


Ex. 3

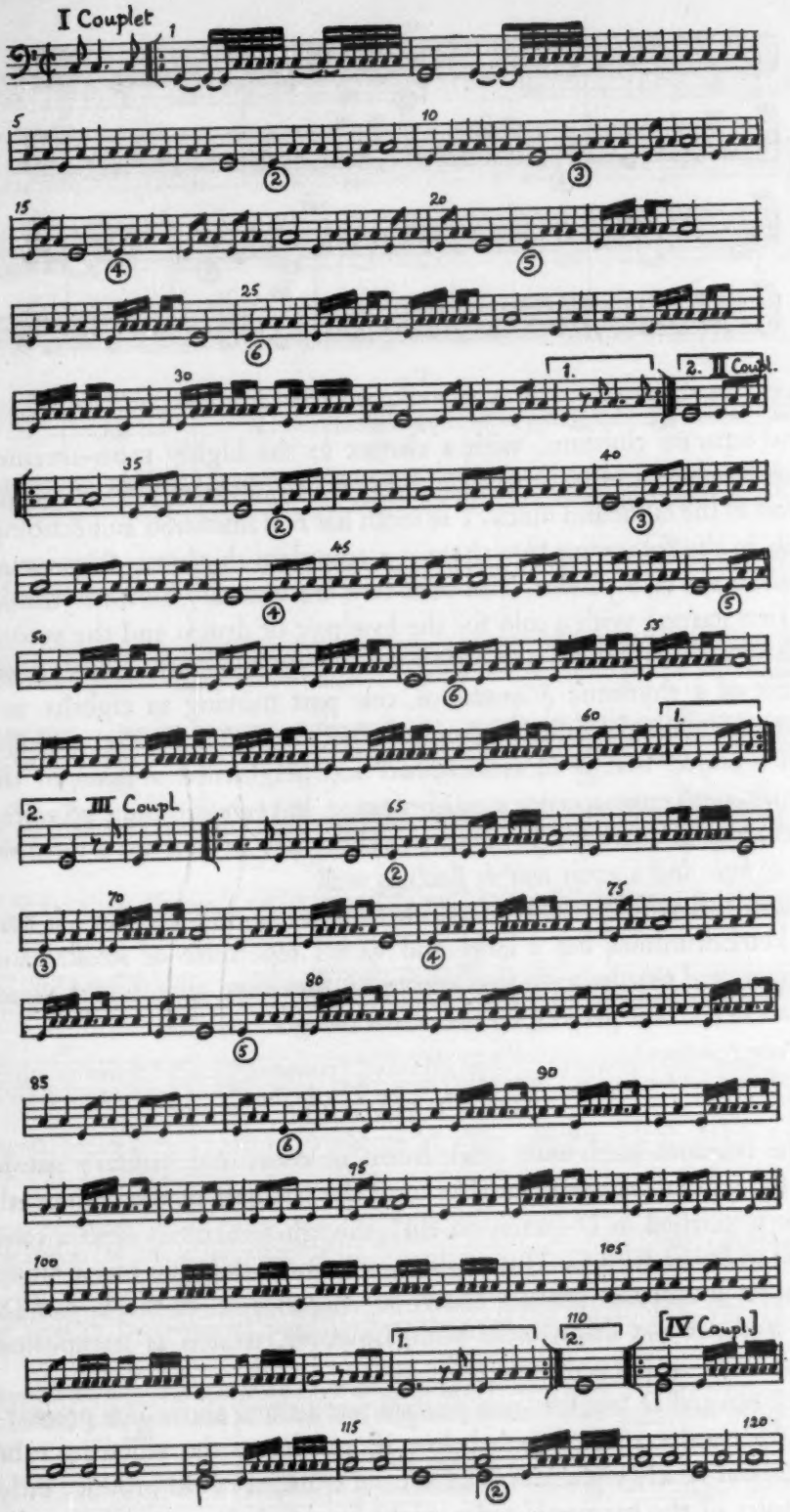
Ex. 4

into conformity with present-day practice.) It contains ten *couplets* of 6, 6, 6, 4, 4, 4, 6, 6, 4 and 6 bars respectively, each having balanced halves. The third and fourth *couplets* present some sharp syncopations (measures 14, 17, 19, 21), and the last contains examples of triplets.

Two of the marches in this collection were composed for the Gardes du Roy by Claude Bab(e)lon, who was Louis's *timbalier des plaisirs*, i.e. a kettledrummer who, together with four *trompettes des plaisirs*, stayed near the king for private service at his 'pleasure'. Taken from the Noailles Company, this special drummer received from the king's privy purse the magnificent sum of 1,200 pounds a year.

The first of Babelon's marches, Ex. 4,[21] has five *couplets* of 6, 8, 8, 14 and 12 bars. Despite the phrasing, the piece is rather monotonous because only five bar-rhythms are used. The second march, Ex. 5,[22] is more advanced and highly organized. There are four large *couplets*, each repeated. The phrase-lengths are varied and irregular, but evince a definite logic. The encircled numbers represent Philidor's own indication of the phrasing. From this we see that in every *couplet* all the phrases begin with the same motive; that this motive is the same for both the first and third *couplets*; and that the final phrase of each *couplet* is expanded and extended beyond the length of the other phrases. After an introduction of attention-calling rolls, the first *couplet* proper gets under way. The second *couplet* presents contrasting material. The third returns to the style of the first, though incorporating material from the second. The last section, with its basically longer note-values, gives a broadening effect, heightened by the repeated drum-chords (the earliest known consistent use of this practice). All four *couplets* are further knit by their common use of one sixteenth-note motive, the end of which is slightly changed in the third and fourth *couplets*. A great many rhythmic subtleties increase the interest of the composition. For example, the sixteenth-note motive, which usually starts on the first or third quarter of the measure, is displaced one quarterbeat in bar 59; and in bars 61–4, three measures of written 2/2 time are really two measures of 3/2 time according to the actual rhythm. This march is indeed quite a masterpiece for a composition limited to but two notes.

The most intriguing item in the collection, however, is a four-hand duet for two pairs of kettledrums composed and performed by the two Philidor brothers, André and Jacques, at Versailles for Louis XIV's carrousel of 1683. For this march, Ex. 6,[23] one brother had a pair of drums tuned to *G* and *c*, while the other's was tuned to *e* and *g*. The seventeen *couplets* in the piece contain much variety and ingenuity. In the first three *couplets* the two lines are homorhythmic. The next three



Ex. 5 (continued overleaf)

Ex. 5

show separate rhythms, with a climax in the highly cross-accented seventh *couplet* and return to simple homorhythm by way of syncopation in the eight and ninth. The tenth has real imitation and echoing, while in the following two there is a complete rhythmic *Stimmtausch* between the two players. The next two are basically homorhythmic, the first starting with a solo for the low pair of drums and the second with a solo for the high pair. The fifteenth and sixteenth *couplets* again consist of a rhythmic *Stimmtausch*, one part moving in eighths and sixteenths while the other has majestic half notes. The work concludes with a *couplet* that is an embellished and heightened version of the seventh, with cross-accents, quasi-imitation and echoing right up to the concluding double roll. At the carrousel this *tour de faste* was a virtuoso *tour de force* and a great *tour de florès* as well.

From this whole corpus of solo kettledrum music, we can see that the kettledrummer has a large and varied repertoire of strokes and motives; and that he gave free rein to his inventive gifts, which were, at least in the best players, by no means meagre.

THE TRUMPETS

The trumpet used with kettledrums in court and military music was the natural trumpet, usually, until the last half of the eighteenth century, pitched in D (rarely in E♭), though sometimes with a tone crook to lower it to C. This explains why most Baroque music using trumpets and drums (usually festive in character) is in the key of D. The trumpet and drum were both, however, treated as transposing instruments, and hence written for in C.

The normal D trumpet was pitched not a third above our present-day B♭ trumpet, but a sixth below it, and hence the vibrating tube length was nearly eight feet. The natural trumpet could produce only the notes of the harmonic series, eight-foot *C* (so written) being the

Ex. 6 (continued overleaf)

Ex. 6

fundamental. The fundamental was practically impossible to play and a worthless note at best,[24] so that the usable notes began with the second harmonic, *c*, and continued up as high as *g'''*, the twenty-fourth harmonic. Harmonics 7, 11, 13, 14, 17 and 19 were considerably out of tune. Each trumpeter, however, was not expected to play the entire series of harmonics; rather he specialized in one portion of the range and played only those parts confined to it, as will be described later on.

We have no definite example of the earliest cavalry trumpet signals. Some idea of what they were like can be had from looking at fourteenth-century *caccie* and some *virelais*, as well as Josquin's *Fanfares royales* (probably composed for the enthroning of Louis XII in 1498) and the corpus of sixteenth-century battle-pieces. There have been preserved, however, many of the official signals from the sixteenth, seventeenth and eighteenth centuries.[25]

The music of the preserved cavalry signals gives only the main trumpet line. All the signals lie within the range covered by harmonics Nos. 2–10. The seventh harmonic (the out-of-tune *b♭'*) is almost never used and other harmonics are quite rare. Thus the signals use the notes of the C-major triad almost exclusively and are confined principally to the notes *g c' e' g' c''*. As stated earlier, the kettledrummer had to know all these signals by heart, in order to supply an appropriate bass. A French ordinance describes the function of the kettledrums in one of the cavalry signals, the called to attack:

> The 'Charge' for the kettledrum is nothing but a very great noise produced by animated rolls, which go from the right kettledrum to the left and from the left to the right, with some detached strokes; as this

noise constitutes exactly the underlying bass for the trumpets, it suffices that the kettledrummer have a good ear to fulfil this aim.[26]

Besides the various battle signals, the trumpets and kettledrums played all sorts of marches, flourishes and fanfares often met under the names of *Aufzug*; *Abtrupp*; *sonnade*, *sonnada*, sennet (and other variants); *serssemeda*; *entrade*, *Intrade*; *tocceda*, *toccata*, tucket, tuck, *touche*, and *Tusch*. Most of these pieces had from two to six trumpet parts in addition to that for kettledrums. The commonest medium was three or four trumpet parts with kettledrum, the trumpet parts often having been doubled or tripled at will. From the very end of the sixteenth century there is a manuscript containing twenty-four *Aufzüge* for a trumpet. These make use almost exclusively of the notes *c'* *e'* *g'* *c''*, but in nine of them there are in addition parts for a second trumpet, playing mainly above the other trumpet and covering the notes of the harmonic series *g'* to *a''*. Kettledrum parts are easily supplied for these pieces.[27]

One of the earliest trumpet pieces for which we have all the parts is the fanfare that opens Monteverdi's *Orfeo*, first performed in Mantua in 1607. When the work was published two years later, the fanfare was termed *toccata*. This word as applied to trumpet fanfares has a history going back into the fourteenth century; and the later keyboard *toccata* had its origin in the old trumpet *toccata*.[28]

The list of instruments provided by Monteverdi in the published edition[29] includes one *clarino* and three *trombe* (the word *clarino* properly refers to the top part of the trumpet range and not to the instrument itself). The *clarino* obviously performs the highest part of the *toccata*, while the three *trombe* play the parts labelled *quinta*, *alto e basso*, and *vulgano*. That leaves the bottom part unaccounted for. This *basso* part was clearly designed for kettledrums; the drums were so much taken for granted where trumpets were involved that they did not even have to be included in the list of instruments. The kettledrummer may have rolled throughout on the note *c*; but if he was any good, he enlivened his part rhythmically, as did probably the fourth trumpeter too.

The names given to the several instrumental parts of the *toccata* by Monteverdi were not the only ones in use; other seventeenth-century writers, such as Michael Praetorius (1618), Girolamo Fantini da Spoleto (1638) and Daniel Speer (1687) list similar series. Thus the almost never-used fundamental, *C*, was called *fladdergrob*, *flattergrob*, and *sotto basso*. The second harmonic, *c*, was termed *grob*, *basso*, and *bass*. The note *g* had the names of *vulgano*, *volgan*, *vurgano*, and *faul-stimme*. The part centred on *c'* was *alto e basso*, *alter-bass*, *striano*, and *mittelstimme*; while that on *e'* and *g'* was *quinta*, *principal*, and *prinzipal*.

A part located primarily above these in the octave *c''*—*c'''* was *clarino* or *clarin*.

In general, however, one can speak of three different kinds of trumpeter. The first was the 'bass trumpeter', who played the low parts and was confined to the notes *c*-*g*-*c'*; he therefore, like the kettledrummer, sounded only the tonic and dominant. The second was the 'prinzipal trumpeter', who played in the middle range from *g* to *c''*; this range coincided with that of the battle signals, as mentioned above, and thus it was a prinzipal trumpeter who sounded these signals in the field.

The third kind was in a special class by itself. This was the 'clarin trumpeter', who had the difficult task of playing the top part of the trumpet range, where the harmonics fell closer and closer together. It was he who showed himself to be the real virtuoso among trumpeters. The *clarino* part of the *Orfeo* toccata lies in the range *c''*—*a''*; but any clarin trumpeter was expected to play up to *c'''* (the sixteenth harmonic) without giving it a thought. Sometimes these clarinists had to ascend to *e'''*, and at least by 1618 (in Praetorius) they occasionally played *f'''*; while later it was not uncommon for them to reach *g'''* (the twenty-fourth harmonic).

In most many-voiced trumpet and kettledrum music, there were two *clarino* parts, unlike the *Orfeo* toccata. These normally functioned as a duet, and played close together and in the same rhythm. An inspection of the parts shows that *clarino I* rarely descended to *c*, but lay mainly in the range *g'*—*c'''* with some higher notes. *Clarino II* also rarely went down to *c*, and confined itself primarily to the range *e'*-*a''* with an occasional *c'''*. Sometimes, in extended playing high in the harmonic series, the two clarinists would exchange their parts back and forth so as to share more equally the taxing burden. Of course, since the clarin trumpeter was not responsible for the entire range, he could concentrate on developing the particular embouchure and breathing technique needed for the high register to which he would be confined for the rest of his life. Nevertheless, his was a most exciting and arduous job, and merits the utmost admiration. To help him scale the heights the clarinist employed a special mouthpiece with a small shallow cup and a wide rim to give the most support to the lips. This was one of the secrets that the Guild trumpeters so jealously kept from unauthorized people.

Another Guild secret was the highly developed technique of double and multiple tonguing, by which lightning speed and more accurate intonation were produced. The essence of the technique is that the wind-stream was regulated by moving the tongue as though pronouncing the syllables *ta* and *ke* in different rapid combinations. This

was part and parcel of trumpeting, and the players made frequent use of it to embellish passages that did not require it. For example, where a pattern of one eighth-note followed by two sixteenths was called for, the trumpeter often would, by multiple tonguing, change the two sixteenths into triplets, four thirty-second notes, quintuplets or even sextolets.[30] Of course kettledrummers could make similar changes also. So great, furthermore, was the bond between trumpets and kettledrums that the main drum patterns became known as 'tonguing strokes' (*Zungenschläge*), and the kettledrummer was said to pound out 'single tonguing', 'double tonguing', 'legato tonguing' and so forth. Other trade secrets of the trumpeters were a method of half-tying successive notes of the same pitch without tonguing, called *Schwebung*; a sort of flutter-tonguing used for whirring prolonged final notes; and the technique of trilling very rapidly with the lips.[31]

The trumpet and kettledrum fanfare such as heralded the arrival of royalty, preceded a toast at a banquet or announced the beginning of a dramatic performance was usually a loud glorified and extended C-major triad ending in a long flutter-tongued chord. And writers of the seventeenth and eighteenth centuries are careful to say that the kettledrummer, before the final chord, must always produce a long tremolo with fast alternations between the two drums; and that, just when the trumpets stop, he is to give a determined, resounding blow on the C drum.[32] Ex. 7[33] is a simple illustration of such a fanfare, for four trumpets and kettledrums; and the variations are endless.

Ex. 7

Trumpet signals and fanfares were not sounded just once; they were always played three times. This was in accordance with a long-standing tradition which could be observed in divers other manifestations. For example, the French coronation ritual, which had remained the same for centuries, prescribed that when the king was seated on the throne, the archbishop was to proclaim three times, 'Vivat Rex in Aeternum!' To this a regiment of *Gardes* outside the cathedral responded with three volleys of firearms. And during English coronation banquets the

king's health was drunk 'three times three', following which the king bowed three times. In the fifteenth century French tournaments, the king-at-arms ordered a trumpet *sonnade* to be played, and then shouted to the combatants three times, 'Soiez prests pour cordes coupper!' ('Be ready for the cutting of the cords'). Likewise, in the last Act of *King Lear*, just before the famous combat in which Edgar mortally wounds his treasonous bastard brother Edmund, there are the following lines:

> *Duke of Albany* Come hither, herald,—Let the trumpet sound,—And read this out.
> *Captain* Sound, trumpet!
> *Herald* 'If any man of quality or degree within the list of the army will maintain upon Edmund, supposed Earl of Gloster, that he is a manifold traitor, let him appear by the third sound of the trumpet: he is bold in his defence.'
> *Edmund* Sound!
> *Herald* Again!
> Again!

Thus it was that above the *Orfeo* toccata Monteverdi put the instruction, ' Toccata to be sounded three times before the curtain rises.' Similarly in 1608 Guarini's comedy *L'Idropica* was put on in Mantua as part of the wedding festivities of Prince Francesco Gonzaga; and a contemporary description by Follino tells us that the great curtain suddenly opened after the trumpets had sounded their fanfare for the third time.[34]

Furthermore, this account refers to the fanfare as 'the usual signal sounded by the trumpets'. This once and for all points up the error of all those who continued to champion the *Orfeo* toccata as one of Monteverdi's most daring innovations. It is nothing of the sort. This toccata is not an integral part of the work, and bears no relation to the opera proper. It is nought but the customary trumpet and kettledrum fanfare of the kind that preluded dramatic performances on important occasions when royalty was present.

In Fantini's *Modo per imparare a sonare di tromba* (1638) there is quoted a military signal which was likewise to be played three times. But the most engaging item in the method is an *entrada imperiale*, of which only the top *clarino* part is given.[35] It is an ambitious piece of fifty-four measures; and, with a one-bar break in the middle, has consistently four-bar phrases organized as follows: a a′ b b′ c d e f f′ —g g′ h i. In the paired groups the second phrase is an embellished version of the first. The *entrada* calls for the sixteenth harmonic (c''') several times,

and goes below *c''* to *g'* only thrice. The most noteworthy feature, however, is the next to last phrase (h), in which two measures call for an *f♯''* and the following measure for an *f''*. As pointed out earlier, the eleventh harmonic is out of tune, lying between *f''* and *f♯''*; thus every clarin trumpeter had constantly to alter his embouchure and lower this harmonic to get an *f''* that was in tune. Eventually it was found that by readjusting the embouchure the harmonic could be altered upwards as well to produce *f♯''*. This is what the Fantani *entrada* required in 1638, though the *f♯''* did not become very widely used until the eighteenth century.

The admission of *f♯''* into the series of usable tones was significant, for it meant that the leading-tone of the dominant could now be employed to effect a true internal cadence on the fifth degree. Harmonically speaking, the restriction of the kettledrums and lowest trumpets to the tonic and dominant yielded a meagre chordal repertoire. But this *f♯''* added a fourth basic harmony of the three existing ones: (1) tonic in root and six-four positions; (2) dominant (or dominant seventh) in root position; (3) subdominant in six-four position; and (4) dominant seventh of the dominant, in its last inversion.

As stated, Fantini provided only a *clarino* part for the *entrada*. Certainly, however, a second *clarino* part to duet with it was intended, along with low parts for other trumpets and kettledrums. We know that often only the first clarin part was written out and that a second clarin part was improvised to go with it. The easiest way was for the second clarin to play along with the first clarin a third lower. This of course was possible only when the first clarin played *e''* or above; when the first went below *e''*, the second would play one of the next lower harmonics that made good harmony. Such a practice is borne out by Kircher in his *Musurgia universalis* of 1650. Kircher printed what was labelled as three flourishes for two trumpets; but he provided only the top line of each, with the annotation that the second trumpet was to double the first at the interval of a third below.

About this time Nicolaus Hasse was organist at the Marienkirche in Rostock. He composed two short *Aufzüge* for two *clarini* and two *Heerpauken*. The first clarin parts, which are all that remain, were copied by Matthew Locke sometime between 1660 and 1677 on extra staves at the bottom of folio pages in a manuscript of choral music now in the British Museum.[36] As concrete illustrations of how the lower parts of such pieces might be devised, I have made simple reconstructions of the missing second clarin and kettledrum parts. The first *Aufzug* is shown in Ex. 8, so reconstructed; further variations and embellishments are of course possible. A couple of pages later in the

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Ex. 8

manuscript is another line of music which is clearly an adaptation in triple metre of the *Aufzug* material. Ex. 9 shows a basic reconstruction. The second *Aufzug* also has a version in triple metre, this time

Ex. 9

Ex. 10

right alongside the original; both are reconstructed simply in Ex. 10. This practice of creating a new piece by changing the metre of an old one was undoubtedly quite frequent; it is reminiscent of the sixteenth-century dances 'à double emploi' and particularly of the German *Proportz*.

(One of the earliest publications of the famous London music-publisher John Playford was *The English Dancing Master*, which appeared in 1650. Included in the book is a dance entitled 'Kettle Drum'. The piece, however, bears no relation to trumpet and kettledrum music; and why it was given that title, unless because it was a 'round dance', is a complete mystery. John Playford was succeeded in the publishing business by his son Henry, who brought out in 1695 *The Sprightly Companion, Being a collection of the best Foreign Marches, now play'd in all Camps*. A number of the marches contained therein are obviously of trumpet origin, such as *The Duke of Savoy's March*. As with the Hasse *Aufzüge*, one could take the given melody as a first clarin part and supply lower parts for other trumpets and kettledrums.)

Normally all trumpet and kettledrum music was loud, vigorous and bright. For some special reasons, however, the trumpets and kettledrums were played softly. Mersenne wrote in 1636 that military trumpets were sounded with mutes when one did not want the enemy to hear the signal, and also when one was about to decamp. Speer said in 1687 that one could produce an echo effect on the kettledrums by

Ex. 11

playing softly near the rim of the drums and then booming loudly at once nearer the middle.[37] Eisel mentioned the same effect in 1738, and deemed it particularly good just before the end of a piece. And the use of muffled drums for funerals has already been cited. Yet it was generally agreed, and rightly so, that the louder dynamic range was most in keeping with the heroic character of the instruments.

During the seventeenth and well into the eighteenth century the bottom line of music was designed for the kettledrums, and was thus confined to the notes *G* and *c*. In the absence of kettledrums, this part had to be played on a trumpet; but since the trumpet could not play the note *G*, it either substituted its octave *g* and retained the drum's *c* or duplicated the whole drum part an octave higher on *g* and *c'*. Such a bass part restricted to the tonic and dominant was called *toccato*, *touquet*, *toquet*, *doquet* or *ducut*. It became common, even when kettledrums were present to play the bottom part, for a trumpeter to duplicate it at the octave, without a special part of its own.[38]

An intermediate stage in this development can be seen in *La Marche Royalle*, one of the pieces put to paper by Philodor in 1705. I have published and analysed this march elsewhere.[39] The final stage is shown in Ex. 11,[40] the third of six *Aufzüge* composed by Johann Michael Gottmann, court-trumpeter and also, after 1714, *Spielgraf* in the archbishopric of Salzburg. Here there are two crossing parts for clarin trumpets, but with a prinzipal trumpet in addition. The kettledrum part is virtually duplicated by a *touquet* part for a fourth trumpet. But in the present case the *touquet* is noted where it belongs, an octave above the kettledrums.

From later in the century come the eight Prussian cavalry signals in

1. (Regiment der Gardes du Corps)
2. (Vormals Regiment Gens d' Armes)
3. (Vormals Leibregiment zu Pferde)
4. (Vormals Leibregiment zu Pferde)
5. (Vormals Leib-Carabiniers)
6. (Vormals Leib-Carabiniers)
7. (Vormals Bakhoff-Kürassiere)
8. (Vormals Königin-Dragoner)

Ex. 12

Ex. 12.[41] They are *Abtruppfanfaren* used during the reign of King Frederick the Great and were played when the regimental standards entered or left the encampment. All are for two clarin trumpets, one prinzipal trumpet and kettledrums. They vary in quality; though certainly the worst is the seventh, which has a flippant rococo frivolity utterly out of keeping with the character of the medium.

Around 1760 there was published in London a collection of marches

Ex. 13

and trumpet tunes called *Warlike Musick*. For amateur consumption, the publication presented the pieces arranged for keyboard in simple style, the tune as a single line for the right hand and a univocal bass accompaniment for the left. A number of the pieces, characteristically in D major, clearly betray trumpet and kettledrum origin, and are easily reconstructed. As an illustration, I have scored, for an eighteenth-century group as shown in like that of Plate IV, the first piece, entitled *Prince Edward's March* (Ex. 13).

One of the high points in trumpet and kettledrum literature is the *Aufzug* in Ex. 14, printed by Kappey without further identification than that it was 'in the ancient style'. The music suggests the period around 1725. Scored for two clarin and two prinzipal trumpets with kettledrums, this processional piece, when one considers its limitation to three chords, is masterfully wrought from the point of view of form, colour, and harmonic and rhythmic interest. It is trumpet and kettledrum writing of the highest order, a superb example of majestic splendour.

With the waning of the Baroque, attempts were made to widen the capabilities of the trumpet and kettledrum corps by employing trumpets crooked in several different keys. But despite the increased facilities, post-Baroque music for this medium was on the whole of sadly inferior quality. Clearly the court and military trumpets and kettle-

Grand Trumpeter March.

Aufzug, Feierlich (March, solemn).

Ex. 14

drums reached their most illustrious summits during the Baroque-Rococo period, from about 1600 to 1775. It was the magnificent spirit of the Baroque to which these instruments were most ideally attuned and of which they constituted such a transcendent symbol. And it was the Baroque mind that so appreciated their august plangency and refulgent splendour that it elevated them to the highest position possible in its civilization short of apotheosis; one where silver trumpets and kettledrums enjoyed a golden age *intaminatis honoribus*. Truly, in the breadth and depth of their realm, the royal and heroic kettledrums and trumpets served, far more than their share, the glory of heaven and earth *et Marte et Arte*.

NOTES

[1] *Ceremoniel und Privilegia der Trompeter und Pauker*, Dresden, n.d., pp.13-17; L. Degele, *Die Militärmusik*, Wolfenbüttel, 1937, p. 98; H. J. Moser, *Geschichte der deutschen Musik*, 5th edn.: Stuttgart and Berlin, 1930, I, p. 200; do., *Die Musikergenossenschaften im deutschen Mittelalter*, Rostock, 1910, p. 24; W. Menke, *Die Geschichte der Bach- und Händeltrompete*, London, 1934, p. 26; J. A. Kappey, *Military Music*, London, 1894, p. 16.

[2] Degele, p. 99; Moser, *Geschichte*, p. 205; P. Panoff, *Militärmusik in Geschichte und Gegenwart*, Berlin, 1938, p. 113; L. Plass, *Es blasen die Trompeten —Ein Fanfarenheft*, Potsdam, 1935, p. 5.

[3] Moser, *Geschichte*, p. 205.

[4] *Ceremoniel*, p. 23; Moser, *Geschichte*, p. 201, note 1; G. Fechner, *Die Pauken und Trommeln, Weimar*, 1862, p. 7; Panoff, p. 39.

[5] *Ceremonial*, pp. 22, 23; Moser, *Geschichte*, p. 201, note 1; James Turner, *Pallas armata*, London, 1683, p. 235.

[6] Panoff, p. 39.

[7] J. P. Eisel, *Musicus autodidaktos*, Erfurt, 1738, p. 66.

[8] *Ceremoniel*, p. 19 ff.; Fechner, p. 7; etc.

[9] See, for example, Caldwell Titcomb, 'Carrousel Music at the Court of Louis XIV', in *Essays in Music*, Cambridge, Mass., 1955, pp. 206, 7 and Ex. 1,

[10] P. B. de Brantôme, *Oeuvres complètes*, ed. L. Lalanne, II, Paris, 1866. p. 209.

[11] A. M. Mallet, *Les travaux de Mars*, Amsterdam, 1685, III, p. 98.

[12] Zedler, *Grosses vollständiges Universal-Lexicon*, Halle, 1732-54, XII, col. 1092-3.

[13] F. W. Galpin, *Old English Instruments of Music*, London, 1910 (Chicago, 1911), p. 252; C. Ffoulkes, 'Notes on Early Military Music', *Journal of the Society for Army Historical Research*, London and Aldershot, 1938, p. 189.

[14] Mallet, III, p. 98.

[15] Eisel, pp. 66-8.

[16] *Cf.* H. Eichborn, *Die Trompete in alter und neuer Zeit*, Leipzig, 1881, p. 11; Kurt Strom, *Beiträge zur Entwicklungsgeschichte des Märsches*, Sulh-in-Thürin-

gen, 1926, p. 6; G. Schünemann, *Deutsche Fanfaren und Feldstücke aus alter Zeit*, Kassel, 193-, p. 4.

[17] See e.g. Arbeau, *Orchésographie*, Langres, 1589, *passim*; Mallet, III, p. 98; J. G. Kastner, *Méthode complète et raisonné de timbales*, Paris, 1845, p. 24; Eisel, p. 67; Ffoulkes, plate facing p. 195; Schünemann, pp. 4-8; do., *Trompeterfanfaren, Sonaten und Feldstücke*, Kassel, 1936, pp. 14, 15; Curt Sachs, *Handbuch der Musikinstrumentenkunde*, Leipzig, 1930, p. 89.

[18] J. E. Altenburg, *Versuch einer Anleitung*, Halle, 1795, p. 130.

[19] Kastner, p. 13.

[20] André Philidor l'ainé, *Partition de plusieurs marches*, (1705), Versailles town library, MS 168.

[21] Philidor, p. 113.

[22] *Ibid.*, pp. 114-5.

[23] *Ibid.*, pp. 106-10.

[24] For an example of its use, see Schünemann, *Trompeterfanfaren*, p. 66.

[25] In Schünemann, *Deutsche Fanfaren*, pp. 13-16; Hermann Schmidt, *Märsche und Signale der deutschen Wehrmacht*, Leipzig, n.d., p. 12; Panoff, p. 114 ff.; Schünemann, *Trompeterfanfaren*, p. 31 ff.; Mersenne, *Harmonie Universelle*, Paris, 1636, II, pp. 264-5. Also Kastner, *Manuel générale de musique militaire* (Paris, 1848), Plass, and Altenburg, *passim*.

[26] Kastner, *Manuel générale*, p. 13.

[27] For examples of kettledrum parts devised for pieces like these, see Schünemann, *Trompeterfanfaren*, pp. 74-5; do., *Deutsche Fanfaren*, pp. 4-8; Panoff, p. 145. And of course there is no end to the possible variations.

[28] For an account of this development, see O. Gombosi, 'Zur Vorgeschichte der Tokkate', *Acta Musicologica*, VI (1934), pp. 49-53.

[29] Monteverdi, *Orfeo*, ed. Malipiero, 1930, pp. 1-2.

[30] See Plass, ii, pp. 15-8.

[31] Plass, ii, pp. 14 and 17; Kappey, p. 50.

[32] Schünemann, *Deutsche Fanfaren*, p. 6; Eisel, p. 67; Schmidt, p. 13.

[33] Kappey, p. 50.

[34] J. A. Westrup, 'Monterverdi and the Orchestra', *Music and Letters*. XXI (1940), p. 238.

[35] Reprinted in H. Spitta, *Der Marsch*, Berlin, n.d., p. 9.

[36] British Museum, Add. MS 31438, fol. 53b, 55a, 56a.

[37] Schünemann, *Deutsche Fanfaren*, p. 6.

[38] See Galpin, p. 237; Kappey, p. 47; Gombosi, p. 53; Eichborn, p. 13; W. Apel, *Harvard Dictionary of Music*, Cambridge, Mass., 1944, p. 750; S. Meyer and A. Wunderer, *Grundlagen der Instrumentenkunde*, Vienna, 1950, p. 134.

[39] Titcomb, 'Carrousel Music', pp. 210-12.

[40] Plass, iii, p. 26 (cf. also pp. 24-5).

[41] Schmidt, pp. 13-4.

ERIC HALFPENNY

The English Baroque Treble Recorder

MUCH has been written in recent years on the recorder and its music. The present-day revival of the instrument has led to the production of hundreds of thousands of modern replicas, good, bad and indifferent. As yet however, there exists no detailed factual account of the prototype to which the whole recorder movement owes its existence. This study is an attempt to fill the gap by assembling and analysing information gathered, over a long period, from an examination of representative examples of English treble recorders in F, dating from before about 1750.

A surprisingly large number of these instruments have been preserved, having regard both for their comparatively early date in terms of woodwind survival, and for the decline in the popularity of the recorder after the middle of the eighteenth century, when the instrument gradually lost its identity and its prestige among the various ramifications of the flageolet. To this circumstance we owe the fact that most modern recorders are modelled, however remotely, on the Baroque instrument, whose outward appearance they imitate more or less. In England, the jointed *flûte douce* began to make an appearance about 1675, and by 1750 was virtually extinct so far as serious music was concerned; and it is to this comparatively short period of seventy-five years that all true examples of English workmanship belong.

The present study is confined to the treble for two reasons: first, it is the type-instrument, beside which those in other pitches are relatively unimportant among the prevailing instrumental forms; second, because, unlike the lower and higher-pitched recorders of the same period, sufficient examples have survived to give an unusually complete picture of the instrument's general characteristics. The investigation has been kept to English specimens for the simple reason that these were most readily accessible to the writer. There is no reason for supposing that they differ, except in small details, from those currently made in other countries; but as the event proves, the consideration of this single instrumental type, as made in England during this limited period, throws a certain amount of new light on the native school of woodwind manufacture as a whole.

The instruments considered here are the work of five makers:

P. Bressan (fl. 1695, last recorded date, 1725).

T. Stanesby (fl. 1690, d. 1734).
Stanesby Junior (d. 1754).
J. Bradbury } no dates known.
J. Schuchart }

The writer has noted forty-three recorders by the above group of makers, distributed among private and public collections in various parts of the world. Not all are trebles. The following shows their distribution among various pitches.

Super trebles (6th, 5th and 4th flutes)	4
Trebles in F	19
Alto in E♭	1
Alto in D	4
Tenor in C }	5
do. in B♭ }	
Bass in F	3
Pitch unidentified	7

The five makers mentioned above accounted for these instruments in the following proportions:

Bressan	21	including	8	trebles
T. Stanesby	9	,,	4	,,
Stanesby Jnr	9	,,	3	,,
Bradbury	2	,,	2	,,
Schuchart	2	,,	2	,,

The preponderance of trebles may of course be due to the accidents of survival, but it strongly suggests what the Baroque repertoire confirms, namely that at this period the treble recorder was by far the most important member of the family. The list also reveals a notable discrepancy with the tidy F-C series with which we have become indoctrinated in modern times. There was, at least in England, a *diatonic* series of instruments from F treble to B♭ 'tenor'. It seems that whatever may have been the Praetorian convention regarding choirs of flutes, we are wrong in thinking of the Baroque instrument in quite the same way. The diatonic series implies interchangeability on top-line parts with different *tessiture*, since even a C tenor has only the pitch and range of the contemporary oboe, for which it may sometimes have been regarded as a substitute. There seems little doubt however, that the great popularity of the oboe limited the usefulness of these lower recorders, and that normally, 'C treble' parts were given to the oboe as a matter of routine.

I have handled and examined thirteen of the above-listed trebles, and have taken detailed measurements of eight of them, which are tabulated below. It should be said at once that all these instruments are practically

identical in outward appearance, in technological detail and in pitch. Good specimens, of which a fair proportion survive, also have a distinctive tone, which is clearly related to the general proportions of the air column and associated data. While all measurements differ slightly between instruments, they are always of the same *genre*. The impression received on comparing instruments, or examining a fresh specimen for the first time, is not one of uncontrolled empiricism, but of an established prototype transmitted by the *métier* of the craft from maker to maker. For that reason it was not considered necessary to publish measurements of all the instruments examined. Those given here are a fair sample, and are taken from specimens which, so far as is known, are in original condition.

TABLE I: BORE

Instr. No.	1	2	3	4	5	6	7	8	
Width of mouth	12·1	12·1	12·3	12·1	13·0	12·1	11·6	12·8	Aver.: 12·3 Var.: 01·4
Height of mouth	5·0	4·6	4·6	4·6	4·6	4·4	4·3	5·0	Aver: 4·6 Var.: 0·7
				Internal diameters					
Head	19·6	19·5	19·6	19·2	19·6	19·6	19·2	19·2	Aver: 19·4 Var.: 0·4
Body:									
top	19·6	19·0	19·6	19·2	19·4	19·6	18·5	19·1	Aver.: 19·3 Var.: 1·1
bottom	14·4	14·5	14·2	14·0	14·2	14·5	15·0	14·1	Aver: 14·4 Var.: 1·0
Footjoint:									
top	14·4	14·0	14·4	13·8	14·6	14·1	14·5	14·4	Aver.: 14·3 Var.: 0·8
bottom	12·1	12·2	14·5	12·3	12·1	11·5	12·0	10·7	Aver.: 12·3 Var.: 3·8
				Length					Average
Head	132·0	133·0	133·0	133·5	133·0	133·0	133·5	132·0	133·0
Body: between tenons	209·5	209·0	209·0	210·0	209·0	205·0	209·0	204·5	208·0
top tenon	28·0	28·0	28·0	26·5	28·0	28·0	27·5	26·5	27·6
bottom tenon	15·3	15·5	16·0	14·5	16·0	17·0	16·0	16·0	15·8
Foot overall	111·5	108·0	111·0	107·0	100·0	102·5	97·5	101·5	104·9
Total length	453·0	450·0	450·5	450·5	442·0	440·5	440·0	438·0	445·6

TABLE II: NOTE HOLES

Instr. No.	1	2	3	4	5	6	7	8	
				Spacing					
Thumb (from top)	17·5	17·0	14·0	17·0	17·0	13·0	17·0	15·5	Average 16·0
Hole 1 (do.)	33·0	32·0	29·0	32·5	32·0	28·0	32·5	30·0	31·1
1–2	22·0	22·5	22·5	23·0	23·0	23·0	22·0	22·0	22·5
2–3	29·0	28·5	28·0	27·0	28·5	28·5	28·5	29·5	28·4
3–4	33·0	33·5	32·5	31·5	33·5	32·5	32·5	32·5	32·7
4–5	25·5	25·0	25·0	25·0	25·0	25·5	26·0	22·5	24·9
5–6	25·0	24·0	25·0	25·0	23·0	24·5	22·0	23·5	24·0
6–7	24·0	23·0	24·0	25·0	24·0	24·5	27·5	24·0	24·5
				Diameters					
Thumb	6·5	6·4	6·6	5·9	6·2	6·4	6·0	5·9	6·2
1	5·7	5·5	5·8	5·8	5·3	5·6	5·5	5·4	5·6
2	6·3	6·2	6·0	6·0	5·7	6·4	5·7	5·8	6·0
3	6·3	6·2	5·5	5·8	5·6	6·4	5·9	5·7	5·9
4	5·6	5·9	5·5	5·5	5·0	6·1	5·6	5·6	5·8
5	5·4	5·9	6·7	5·4	6·4	6·1	5·6	5·6	5·9
6	5·1	5·3	6·1	4·7	5·5	5·4	5·0	5·3	5·3
7	5·0	5·1	5·2	5·0	5·1	5·4	4·7	4·8	5·0

Measurements are given in millimetres, to the nearest one-tenth. Conicity of the body is shown by internal diameters at the ends of the tenons. The head-bore and total bore lengths are measured from the underside of the block. The Talbot 'edge-to-edge' method is used to express the spacing of the noteholes. Each measurement is averaged to the nearest decimal, and the variation between greatest and smallest of any dimension is noted in some instances.

The following terms are used:

Fipple. The whole of the mouthpiece end, enclosing the windway and block.

Tongue. The bevelled edge of the mouth.

Mouth. The rectangular aperture in the head.

The following instruments were measured, and are hereafter referred to by their numbers only.

1. *Pul Bressan* (roses). Property of Lady Huntingdon. Dark-stained with four ivory mounts.
2. *Pul Bressan* (roses). Property of Edgar Hunt. Dark-stained with four ivory mounts.
3. *T. Stanesby* (star). Property of Eric Halfpenny. Dark amber figured staining, unmounted. Head joint by Pul Bressan.
4. *T. Stanesby* (star). Horniman Museum, London, Carse Collection No. 319. Ebony with four ivory mounts.
5. *Stanesby* (Dolphin). Property of Eric Halfpenny. Dark amber figured staining, unmounted.

6. *Jo Bradbury* (crown). Property of Miss Marilyn Wailes. Dark amber staining, unmounted.
7. *IuI Schuchart* (ribbon knot). Horniman Museum, Carse Collection, No. 274. Dark amber staining, unmounted.
8. *Stanesby Iunior*. Horniman Museum, Carse Collection No. 275. Dark amber staining, unmounted.

TECHNOLOGY

WINDWAY

This tapers in depth and very slightly (about 1 mm.) in width from the top to the bottom. At the top the windway slit is crescent-shaped, i.e. set on a very slight 'thumb-nail' curve, widest at the centre line and narrowing to the edges. At the bottom the windway slit is uniform in depth but conforms to the same cross curvature. Its lower edges are given a small bevel or chamfer. The windway surface of the block is finished parallel to bore axis and level with the under-surface of the tongue edge. (See Plate V.)

The tapering depth of the windway, and also its initial 'crescent' section are formed in the wall of the fipple itself. The first has the effect of directing the air jet very slightly downwards, towards the interior of the instrument. The formation of this taper, and the generally narrow proportions of the windway, especially at its lower end, favour a high-pressure, high-velocity wind. These instruments will therefore stand hard blowing with scarcely any perceptible fluctuation in pitch. They offer a satisfying resistance to the breath—a feeling that the instrument's response is the rewarding product of reasonable effort. It is clear that the slight deflection of the air jet, and its diffusion at a wider angle by the chamfers at the lower edges of the windway are factors which are very delicately adjusted to develop optimum sonority without overdriving the instrument.

The crescent section favours maximum air-pressure down the centre region of the windway, and in practice it has been observed that this 'feathers' unwanted moisture to the edges, whence it drains away without trouble. These instruments are, in fact, notably free from 'clogging', the besetting evil of so many modern recorders.

HEAD BORE

The bore of the head is cylindrical. The measured specimens show a mean diameter of 19·4 mm. with a noted variation of 1·1 mm. In no case does it exceed 19·6 mm. This conforms so closely with the bore of contemporary transverse flute head-joints, which are also cylindrical, that it may be assumed that the same tools were used for both types of instrument by the makers of the time.

PLATE V

X-ray Photograph of Treble-Recorder head joints:

A. Bressan. Grosvenor Museum, Chester, No. 507
B. Bressan. Halfpenny Collection (No. 3 in text)
C. Stanesby. do. (No. 5 in text)
D. Bradbury. Wailes Collection (No. 6 in text)

PLATE VI

A B C D

Foot Joints of Treble Recorders

(as A to D in Plate V)

PLATE VII

A B C D

Head Joints of Treble Recorders
(as in Plate V)

PLATE VIII

A B C D

English Baroque Treble Recorders

TONGUE

The speaking edge conforms to the curvature of the lower end of the windway. Since this curve is of wider radius than the head bore, the tongue is undercut at the corners. It is not, however, undercut at the centre line, where it aligns with the bore of the head (Plate V). The width of the mouth is approx. one-fifth of head bore circumference, with height approx. three-eighths of width. Tongues are cut with almost parallel cheeks in the thickness of the head wall (i.e. parallel with bore axis and chordal to bore section). The ramp of the tongue is long and gradual, averaging about 19 mm. at the sides (this measurement is not recorded in the tables.) Head joints show a remarkable correspondence in their length from under the block to the end of the socket. The average is 133·3 mm., with a variation of only 1·5 mm.

BODY

The taper of the bore commences at the top of the upper tenon and continues through to the end of the lower tenon. Note holes are relatively small and heavily undercut, and show considerable divergence of size on different instruments. Clearly, the final decisions on tuning, response and evenness of tone were settled separately at the bench for each individual instrument. This involved the fine adjustment of hole diameters and their undercut. Instruments in original condition invariably show traces of gum lining some of the note holes, where too much wood has been removed, or where further trials of the instrument have dictated it. Such tuning plastics are still in use in woodwind workshops. For this reason it is a mistake to clean out noteholes of an old woodwind instrument too thoroughly when restoring it. There is a reduction of about 25 per cent in the bore diameter through the body. A notable feature is the low position of the left hand 3rd ('D') hole, very nearly equidistant between its two neighbours. The walls of the body are slightly thicker at the lower end.

FOOT

The bore in most cases continues to contract, though not necessarily at the same rate as in the body. At least one example exists with a cylindrical or slightly expanding foot bore, but in general, the contraction is at a greater rate than on the body of the instrument. Not only in conicity but also in length, the foot joint shows considerably more variation than the rest of the instrument. The older makers, Bressan and T. Stanesby favoured a foot joint nearly half as long as the body (between the tenons). Their successors, however, shortened the

foot by between 8 and 10 mm., the contraction being relatively greater and the pitch remaining constant. (Plate VI.)

EXTERNAL DETAILS

HEAD JOINTS

The fipples are cut with considerable care and elegance to form a narrow beak, very comfortable for the lips of the player. The cut or scallop is sometimes given a sideways rake, especially on the larger recorders, so that the player may cant the instrument towards his lower hand and still have a comfortable mouth position. The earlier type of fipple, found only on instruments by Bressan and T. Stanesby, has a short beak curving rather abruptly at first and flattening out to a more gradual incline to the back of the head. On later instruments the beak is longer and more delicate, and the curve is more rounded and even, and meets the back of the head at right angles. (Plate VII.)

Below the fipple is turned a thick deep ring of rounded section, supported above by reeding and below by a shoulder which marks the upper edge of the mouth. Between this point and the socket, the head tapers externally very slightly. The socket swelling is vase-shaped with a rounded ring below, a double reeding about midway, and a single fine ring with slight shoulders at the top.

BODY

This carries no ornamental details and is merely tapered very slightly towards the lower end.

FOOT

The boss which carries the lowest finger hole is slightly *bombé* or barrel-shaped, with rings and reeding above and below. The 'bell' is generously flared and the waist gracefully curved. It terminates in a thick rounded rim, above which there is always a deep-cut flange or fillet.

The wood most used is pear, but some of Bressan's instruments appear to be of beech or cedar. Ivory mounts were fitted by Bressan almost as a matter of course, but are exceptional with other makers. The majority of Bressan instruments are stained black, only one or two surviving specimens bearing the more typical English amber polish with artificial figures induced in the grain of the wood by acid treatment.

The double-bored sixth and seventh holes on the Bressan treble and alto recorders at the Grosvenor Museum, Chester, are quite exceptional

and are to be found on no other instruments of the same age that I have examined or heard of.

The details in the lathework described above never vary on English instruments. It is of course true that the general conventions are those found all over Europe on recorders of the same period, but the English profile is nevertheless unmistakable. This is a very remarkable circumstance, for turning is a free-hand craft, offering the same kind of latitude for individual taste as does the outline of the violin. Indeed, this shows clearly enough in woodwind lathework of the second half of the eighteenth century, when no two makers ever produced quite the same profiles. Yet so closely do these English recorders tally in their outward appearance that they might all have been fashioned by the same hand and with the same tools (Plate VIII). Nor is it a question of 'mass-production', or of the slavish copying of a single prototype, otherwise the measurements would surely show fewer discrepancies than they do. These English Baroque conventions have the artistic unity of a single 'school'. They are to be seen, in a less striking degree, in oboes by the same group of makers illustrated by me in Galpin Society JOURNAL II (Plates II and IIIA). Here is exactly the same unity of style and form, and an additional bond between at least two of the makers listed at the beginning of this article, Bradbury and the elder Stanesby. The link between Stanesby and Bressan may also be inferred by their common style. Both used the stub fipple and the long foot joint on their treble recorders. Moreover the Bressan head of No. 3 has all appearance of having been made for the instrument, the polish and staining being identical, and quite unlike Bressan's usual finish. I have already shown the connection between Talbot's Manuscript and Bressan, which proves that by 1695-98 he was well-established in this country (see JOURNAL VIII). If the French recorders and oboes really made their first impact in Great Britain at *Calisto* in 1674, it is probable that Bressan was brought over here soon afterwards to satisfy the demand for these new-type instruments. If so, it is highly probable that Thomas Stanesby was one of his first English pupils. Stanesby must have come out of his indentures and embarked in business on his own account well before the end of the seventeenth century, since his son was born in 1692.

According to Stanesby Junior's trade card, neither he nor his father communicated their 'mistery' to assistants, and although the former subsequently took Gedney into partnership, we must assume that J. Bradbury and J. Schuchart were both younger contemporaries of the father in the Bressan workshop. It is unlikely indeed that the comparatively new craft of making these high-precision jointed woodwind

instruments in this country should have sprung from more than one root. That root, it seems, was Bressan, the prolific author of nearly half the surviving recorders made in England during the Baroque period.

I wish to express my indebtedness to all those owners of instruments mentioned herein for their courtesy in allowing me access to them. I am particularly obliged to Miss Marilyn Wailes, and to Mr Graham Webster of the Grosvenor Museum, Chester, for permission to photograph the instruments illustrated in the plates; also to Mr William Lichtenwanger, of the Library of Congress, for much valuable information on instruments in the Dayton Miller Collection. This study has been assisted by a Leverhulme research grant.

R. MORLEY PEGGE

The Regent's Bugle

In the room that serves me as a bedroom, workshop, library and repository for some sixty brass instruments of assorted shapes and ages, there stands on a chest of drawers an elegant box containing what I believe to be the answer to one of those minor mysteries that still cloud our knowledge of the evolution of wind instruments. This is a large-bore short model slide-trumpet (Plate III) with the conical enlargement towards the bell rather more pronounced than was usual for coeval orchestral trumpets.

It is a handsome piece, of sterling silver parcel-gilt, bearing the hallmark of 1819-20; the photograph shows it with its E♭ crook. Built in F it has its full complement of original crooks (E, E♭, D and C), together with a mouthpiece and two tuning bits, one long and straight and the other short and bent. These last three items, also of silver, are of much later date and, although they fit the instrument do not, I suspect, belong to it, but found their way by accident into the box which has no compartment for any tuning bits. The trumpet has a single instead of the more usual double spring-box and the slide has an extension of only $2\frac{1}{2}''$ as compared to $4\frac{1}{2}''$ on the ordinary orchestral slide-trumpet, so that the customary short bent tuning bit is not necessary even when no crook is used. On the rim is engraved the maker's name JAMES POWER, 34, STRAND, LONDON, the spring-box being marked KEAT. Altogether something of an enigma.

Before coming into the possession of its present owner this trumpet belonged successively to the Harpers father (1787-1853) and son (1816-98), the most famous trumpeters of their time, and then to the late W. F. H. Blandford, the great authority on brass instruments.

A second instrument of similar model, but of brass and without embellishment, was examined by Mr Blandford in 1895, when it was in the hands of a Whitby resident, and the sketch and copious notes he made about it then are now in my possession. It differed from the Power trumpet in that it had a slide extension of $3\frac{1}{2}''$ and although its crooks, if any, had been lost it still had its original mouthpiece. This mouthpiece, quite unlike that of a trumpet, had, according to Mr Blandford's notes, 'a deep hornlike cup without angle, $\frac{7}{8}''$ deep, the 'grain' small; width across cup (without rim) $\frac{21}{32}''$; length $3''$; it is quite unsuitable for brilliancy but gives a smooth hornlike or cornetlike tone.' The instrument was marked CLEMENTI & CO. and, over the date

1832, W.P.B., the initials standing for 'Whitby Pink Band'; it was said to have been played by the leader of the band.

Consideration of these two trumpets coupled with a notice in Sachs' *Real-Lexikon der Musikinstrumente* which reads as follows:

> *Regent's Bugle*, ein 1815 nach Angabe Joh. Gg. Schmidt's von Percival in London gebautes Zug-Flügelhorn, dessen Töne um 1-5 Halbtöne vertieft werden konnten.

led Mr Blandford to the conclusion that the hitherto nebulous Regent's bugle was, in fact, just such a short model slide-trumpet. This view he put forward in a series of letters to *The Musical Times* between May and August 1925.

Here is what some other authorities have had to say about the Regent's bugle:

> *Allgemeine musikalische Zeitung* (Leipzig), 1815, p. 637. Under the heading 'Wichtige Verbesserung des Horns' describes the Regent's bugle, made in England under the direction of Schmidt, of Thürn as a 'Jagdhorn mit einem Auszug nach unten ein Quarte tiefer u. dadurch alle diatonische u. chrom. Tonstufen von Grundnote aufwärts'.

> Fétis, *Biographie Universelle des Musiciens*:
> Schmidt, Jean-Georges, virtuose sur la trompette, né dans un village près d'Erfurt, en 1774, se fixa à Londres en 1800, et y fut attaché au théâtre de l'Opéra italien. Quelques années après, il eut le titre de première trompette de la musique du prince régent d'Angleterre. Il vivait encore à Londres en 1815, oú il fit l'essai public d'un cor chromatique à clefs de son invention, auquel il avait donné le nom de *Regent's bugle*. Cet instrument, qui n'était qu'un perfectionnement du bugle-horn de Halliday, fut adopté dans la musique de tous les régiments anglais, et passa à la même époque sur le continent.

> Pontécoulant, Comte Ad. de, *Organographie*, II, p. 111:
> Schmidt, trompette de la garde du Prince Régent, en Angleterre, apporta, en 1811, quelques perfectionnements au clairon d'Halliday et les fit adopter dans les corps de musique de l'armée anglaise.

> Mendel, Herman, *Musikalisches Conversations-Lexikon*:
> Schmidt, Johann Georg, Virtuose auf der Trompete, ist bei einem Dorfe bei Erfurt 1774 geboren und wanderte 1800 nach London, wo er sich niederliess. Er wurde bei der italienischen Oper angestellt und erster Trompeter bei der Musik des Prinz-Regenter von England. Als solcher macht er öffentliche Versuche, auf einem Ventilhorn zu blasen, welches er '*Regent's bugle*' nannte und welches mit Verbesserung des '*bugle-horn*' von Halliday versehen war. Es wurde bei der englischen Militärmusik und auch auf dem Continent eingeführt.

Stone, W. H., *Grove's Dictionary*, 1st ed.; art. *Bugle*:
. . . The key-bugle, called also the 'Kent bugle' and 'Regent's bugle'. . . .

Carse, Adam, *The Orchestra from Beethoven to Berlioz*, p. 413:
The Regent's bugle was an improved form of Halliday's keyed bugle, devised in 1811 by J. G. Schmidt. . . .

The overriding impression conveyed by these notices, apart, perhaps, from those of Fétis and Sachs, is that none of the writers thought the Regent's bugle worth the trouble of any independent research. Thus Mendel copies Fétis almost literally, but makes a bad blunder in translating '*cor chromatique à clefs*' (key-bugle) by '*Ventihorn*' (valve horn) instead of by '*Klappenhorn*'—a very different matter. Mr Carse, rather surprisingly, seems to accept de Pontécoulant without question. De Pontécoulant, useful though he is in some respects, is notoriously inaccurate, even to the point of frequent misspelling of his own countrymen's names. It is hazardous to accept any statement of his at its face value, the essential purpose of his book, like that of Kastner's *Manuel général de musique militaire*, being to boost Adolphe Sax at the expense of the established French wind instrument makers. Dr W. H. Stone airily dismisses the matter by saying that the terms 'Kent bugle' and 'Regent's bugle' were synonymous, which is most unlikely. Only Dr Sachs appears to have gone to the fountain head, and it is unfortunate that he has not thought it worth while to be more explicit as to the source of his information.

From his letters to *The Musical Times* it is clear that Mr Blandford had no idea who Schmidt was, and that his acquaintance with Percival was confined to knowing of his reputation as a maker of the short straight English hunting horn. He does say that 'somewhat later John Köhler & Son . . . were equally famous as makers of orchestral slide-trumpets and these little horns . . .', but admits to being unaware of any connection between the two. Of Keat he merely remarks that the name is well known in the manufacture of brass instruments. It is therefore evident that this theory was something of a shot in the dark, but in the light of later research into the history of early nineteenth-century English wind instrument makers it looks as though he had shot pretty straight.

Since both Fétis and Dr Sachs agree on this point we may, I think, accept the date 1815 as substantially correct, but that the Regent's bugle was just some vague improvement on or variant of the key-bugle seems, in spite of reiterated assertions to this effect, highly improbable. As Mr Blandford pointed out in one of his letters, Percival (or, more exactly, Köhler & Percival, as we shall see later on) was a maker of some reputation who, if his instrument was merely a crib of

Halliday's, would hardly have committed the solecism of exchanging the name of the Duke of Kent for that of his elder brother the Prince Regent. In any case the key-bugle continued to be called the Kent bugle until about mid-century when, vanquished by the cornet-à-pistons, or cornopean as it was then called in England, its not inglorious career came to an end.

It was in 1810 that Joseph Halliday, bandmaster of the Cavan Militia, then quartered in Dublin, took out a patent for 'certain improvements in the musical instrument called the Bugle Horn', which improvements consisted in the addition of keys to the number of five. He appears almost immediately to have sold the patent rights for £50 to the Dublin maker, Matthew Pace. Out of compliment to H.R.H. the Duke of Kent, commander-in-chief of the British army, the instrument was called the 'Royal Kent Bugle'. Other Dublin makers, notably Ellard and Turton, were making key-bugles at an early date; one in my own collection is marked *Royal Patent Kent Bugle Made by A. Ellard, Dublin, No.* 584, *Halliday Inventor.*

Much of its success at the outset was undboutedly due to the virtuoso John Distin, who became solo bugle in the band of the Grenadier Guards in 1814, and his performances on it during the Allied occupation of Paris in 1815 probably had much to do with the introduction of the key-bugle into continental army bands. At all events by that time it was far too well established in England for any 'variant', which could only mean a similar instrument with extra keys, to masquerade as a new invention and be given a new name. As a matter of fact extra keys were sometimes added to facilitate certain trills, though six was always the standard number.

Johann Georg Schmidt was not only solo trumpet in the Prince Regent's very hand-picked band, but he was generally acknowledged to be one of the finest trumpeters in Europe. Was it not said of him that 'his flourish was the most terrific and appalling thing ever heard from a musical instrument'? Small wonder, then, if Schmidt should want to try and outshine the popular Distin. Sometime colleague of Hyde, whose name is always associated with that of Woodham in the invention of the spring-controlled slide mechanism for the trumpet, Schmidt would assuredly have been quite familiar with the slide-trumpet. Distin owed his popularity to the Royal Kent Bugle? Very well, then, Schmidt would produce a slide-bugle and call it after his patron, the Prince Regent. The large conical bore of the bugle does not, however, lend itself to slide mechanism, so the answer lay in a slide-trumpet camouflaged to look as much like a bugle as possible, and the use of a deep cupped mouthpiece which would modify the

characteristic 'edge' of the trumpet tone. The short slide extension, enough to lower the pitch a semitone with every crook except that for C, which would not in any case be used for displays of virtuosity, would be no disadvantage to the soloist whose range would lie almost entirely in the third and fourth octaves. Such an instrument would be far more difficult to play than the key-bugle, and this would militate against its success with any but the most gifted performers. It is therefore not surprising that specimens are hardly ever met with.

As regards the makers whose names have been mentioned, Thomas Percival was established with John Köhler, nephew of the original founder of the business, at 89, St James's Street by or before 1810, after which for the next twenty years or so the firm's name occurs variously, in different directories, as Percival; Köhler; Percival & Köhler; Köhler & Percival. John Augustus Köhler, when he succeeded his father in 1834 and moved to 35 Henrietta Street, Covent Garden, appears to have cut adrift from Percival who remained in St James's Street until 1848, after which his name ceases to figure in any of the directories. J. A. Köhler contributed a great deal to the development of the valve in England, and was particularly noted for the type of slide-trumpet known as 'T. Harper's Improved'.

Keat, whose name appears on the spring-box is believed to have been apprenticed to Richard Woodham, to whose business he ultimately succeeded. Woodham, acting on the suggestion of the well-known trumpeter John Hyde, was the original inventor and maker of the spring-controlled slide mechanism in the late eighteenth century.

James Power, originally a Dublin pewterer noted for his skill and the finish of his work, set up with his brother as a repairer of brass instruments in 1798. Leaving his brother in Dublin, he came to London in 1807 and established himself at 34 Strand, figuring in the 1808 Post Office directory as a 'military musical instrument maker': he remained at the same address until his death in 1836. Not many specimens of his handiwork appear to have survived, and certainly the most important side of his business by far was music publishing. This silver slide-trumpet is, however, a very special instrument, and it may well be that whoever ordered it considered Power the man best qualified to make it, Keat being called in to make the spring-slide mechanism. It is not impossible that Schmidt himself ordered it, since all the trumpets in the Prince Regent's band were of silver, and the elder Harper may have acquired it when he and Schmidt were colleagues in the orchestra of the King's Theatre.

It is a very great pity the original mouthpiece is missing from the Power trumpet. That which is in the box is an ordinary silver trumpet

mouthpiece of the standard mid-nineteenth century type and is marked BUTLER LONDON. Butler, like Power, hailed originally from Dublin, but he only set up in London in 1858: it is not unlikely he made the tuning bits as well.

The name Clementi & Co. is well known to collectors of old wind instruments, for specimens so marked are by no means uncommon. For all that one may doubt whether this famous firm of music publishers—Clementi himself was a pianist and composer—ever actually made any of the wind instruments that bear their mark, except possibly during the Longman-Clementi partnership (*c.* 1800-1802), which turned ou disastrously for Clementi. Even the flutes marked *C. Nicholson's Improved* and *Clementi & Co.* were, according to R. S. Rockstro, made by Thomas Prowse the elder. It is probable, to say the least, that any brass instruments with their name on them were made by some other firm and were only sold by Clementi. Such a procedure is not uncommon today.

All this fits in admirably with Mr Blandford's theory. The Clementi instrument is important chiefly on account of its original mouthpiece, and this is a bull point. It shows beyond any doubt that the short model slide-trumpet was not only meant to look rather like a bugle but to sound rather like one as well. It would have one notable advantage over the key-bugle, and that is that its timbre would be homogeneous throughout, and not vary according to which key was opened, though mastery of its technique would be far more difficult. All we now need to settle the matter beyond dispute is a contemporary account of a performance by Schmidt on his Regent's bugle. Sooner or later this will come to light, and one more petty mystery will have been solved.

GUY F. OLDHAM

Import and Export Duties on Musical Instruments in 1660

THE fourth Act of Parliament after the Restoration of the Monarchy in 1660 (*Anno duodecimo Caroli II*, Capt. IV.) was entitled 'A Subsidy granted to the King of Tonnage and Poundage, and other sums of Money, payable upon Merchandize exported and imported'. The income from this source was 'for the better Defraying the necessary Expenses ... for the Guarding and Defending of the Seas against all Persons intending or that shall intend the Disturbance of your (Majesty's House of) Commons . . . in the Intercourse of Trade, and in the Invading of this your Realm'.

There follows a list of merchandise commonly imported and exported, together with the rates payable. Items of musical interest are as follows:

THE RATES OF MERCHANDISE . . . ETC.

RATES INWARDS

Bells vocat.		
Morrice bells the small groce, cont. 12 dozen		v.s.
Brass Trumpets the dozen		xij.s.
Citterns, the dozen		iij.l.
Claricords (*sic*) the pair		xiij.s.iiijd.
Fiddles for Children, the dozen		iv.s.
Harpstrings or Catlings the groce, containing 12 dozen		v.s.
Jews-Trumpes, the groce, cont. 12 dozen		x.s.
Lutes	Cullen-making, with cases, the dozen	viij.l.
	Venice making with cases the dozen	xxiv.l.
Lutestrings voc.	Catlings, the groce, containing 12 dozen knots	ij.s.viij.d.
	Minikins, the groce, containing 12 dozen knots	j.l.vj.s.viij.d.
Pipes for Tabors, the dozen		iv.s.
Rattles	for children, the groce, containing twelve dozen	j.l.vj.s.viij.d.
	with Bells, the dozen	vj.s.
Recorders, the set or case, containing five Recorders		j.l.
Stone birds or Whistles, the small groce, containing twelve dozen		iv.s.
Viols, the piece		xiij.s,iv.d.
Wrest for Virginals, the groce, cont. 12 dozen		j.l.iv.s.
Wyer. Virginall wyer, the pound		v.s.

Blowing hornes small, the dozen	iv.s.
Virginals, the paire	j.l.

* Goods Inwards (and Outwards) not rated, to pay 5l. *per Cent.*

The above information was transcribed from *The Statutes at Large, Volume the Third, James the First to William the Third . . . London*: Printed for Mark Basket . . . etc. . MDCCLXIII. pp. 147–63.

Several points of interest arise from this list. Firstly, the absolute and relative prices of instruments, which may be found by assuming the rates given to be at the standard rate of 5 per cent of the actual value, the same as for goods not rated. A clavichord is the same price as a viol; A Venetian lute is twice the price of a virginal or a set of five recorders, and a pound of virginal wire costs as much as a cittern. Secondly, it gives the instruments which figured sufficiently frequently in International trade to merit inclusion in a practical list, or the names by which they would be known to the average Customs collector. Thus at this time, the term virginals would probably include the harpsichord and spinet (Pepys's triangle virginal): viol would possibly include violins, as the violoncello was still known as the bass-viol in Church gallery bands up to the late nineteenth century. Also Jacob Rayman and Christopher Wise were making violins in England at this time which were based on Italian models.

Thirdly, the list gives some idea of supply and demand. It will be noticed that a far greater variety of instruments was imported than exported. There is almost always one noticeable omission in any collection of English musical instruments and that is the clavichord. This is surprising considering that so much of the keyboard music of the late seventeenth century, such as Purcell's airs and dances, is so well suited to the clavichord, although hardly any known manuscripts specifically mention the clavichord or manicord. A number of virginals of *c.* 1660 by such makers as Robert Halley, John Loosemore, John Player, Thomas White, etc. are to be seen, but apart from the isolated example by Peter Hicks of *c.* 1700, the few clavichords which have been found appear to be of German origin. The explanation may perhaps be found in this list: England specialized in the construction of the plucked keyboard instruments and, although clavichords were played, they were imported from abroad.

Notes and Queries

THE VIRGINALISTS' ORNAMENTS

TO THE EDITOR:

No one has yet shown at all conclusively how the ornaments of the virginalists, indicated by a single or double stroke through the tail of the note, should be performed.

Experience shows that the single stroke is best rendered as an upward slide of three notes, while the double stroke may be anything from a snap to a long shake, although a mordaunt is usually the most appropriate.

Further playing experience has suggested to me that this interpretation may not go far enough and I make the following proposal, in all humility, to be shot at by those who know much more than I do.

It is, that the single stroke ornament (as already accepted, almost invariably a slide) is intended to be played *before* the beat and the double stroke ornament (which may take any form) is to be played *on* the beat.

My suggested reasons are as follows:

1. There are many occasions (Munday's *Goe from my Window* affords examples) where the double stroke seems very clearly to demand a slide.

2. There is a considerable number of passages where the two ornaments are used in the same chord. They are sometimes unplayable, and generally nonsense, if played simultaneously. I offer two examples:

(*a*) The Pavana by Thomas Tomkins (*Musica Britannica*, piece no. 56, p. 117, or Fitzwilliam Book, Vol. II, piece no. 123, p. 51). Bar 65 (or bar 11 of the 3rd section) is as shown above (*a*).

In a slow passage such as this, the double strokes would certainly be mordaunts and not snaps. To play a slide and a mordaunt, a sixth apart, in the same hand, as would be required in the first concurrence, is almost impossible, and quite ineffective. In the case of the second one,

owing to the relatively poor articulation of the virginal in its bottom octave, the result would be a confused rattle. On the other hand, if the single stroke is played as a slide before the beat, and the double stroke on the beat, as a mordaunt, the first occurrence is easy to play and both are more intelligible.

(*b*) The Fantasia of Giles Farnably (Fitzwilliam Book, Vol. II, piece no. 208, p. 270). The middle bar of the third line of p. 272 is shown at *b*.

Here again it seems to me that the result, if played simultaneously, is ineffective, but if separated, entirely satisfactory. At the beginning of this piece, in bar 5, the two kinds of ornament are rapidly alternated and here, although it is quite effective to play both on the beat, to play them as I suggest is more interesting rhythmically. (Incidentally, this little known, but very fine piece, is one of those in the Fitzwilliam Virginal Book which is definitely not virginal music, and not only demands an organ or harpsichord, but one with two manuals.)

If my theory is acceptable, might it then be logical to regard the rare and mysterious triple-stroke ornament as a combination of the other two?

CECIL CLUTTON

Book Reviews

Ethno-musicology, Newsletter No. 5, September 1955. (1330 Martha Washington Drive, Wauwatosa 13, Wisconsin, U.S.A.) 17 pp., mimeographed.

There seems little room for doubt that the long-awaited drawing-together of the scattered threads of ethno-musicological research is now in safe hands. Ethno-musicology constitutes perhaps the most urgent field in musical research today. While the musical antiquarian or palaeo-musicologist has time on his side (fresh inscriptions and documents being continually brought to light) the ethno-musicologist has time running against him; his study-material is being rapidly washed away by the global flood of Western habits and culture. Among this vanishing material there is much of great organological interest. Scholars of ancient stringed instruments must surely feel a debt of gratitude to Villoteau, who first reported how the ancient Greek lyre was still being played by the Nubians; and it is since reported that this 'living fossil' is still played by others as well. But sooner or later the living fossils will have become just fossils; though we may still arrange them on the museum shelves, we may find ourselves unable to hear tapes of their music and read proper accounts of their technique and use, and we have enough of such instruments already. Many universities and other established bodies of course realize this, and the number of field workers subsidized by grants and bursaries steadily increases. The difficulty is to keep abreast with their reports, for these generally appear scattered in

anthropological, geographical and folklorist journals and institutional magazines from all over the world; often, also, in most unlikely magazines of general interest upon which one cannot hope to hit save by purest chance. Left to oneself, one is bound to miss something of importance relating to one's particular study. To remedy this, the producers of *Ethno-musicology* are doing splendid work. The 'Notes and News' section briefly informs the reader of the current activities of some twenty field workers and others. Among the items of organological interest in this section, 'the Danish Mission to Afghanistan in 1953-54 . . . found a very interesting musical instrument, an arched harp of very old type; . . .'. Also welcome is the 'Current Bibliography'. In *Newsletter No.* 5, this lists thirty-nine recently-published articles dealing with African music, fifteen (also a new volume) dealing with American, ten (and two new books) with music in Asia and Oceania; also articles dealing with European folk music and some new general studies. These articles are drawn from over forty periodicals, many of which few musicologists would come across in the ordinary way. Formation of an Ethno-musicological Society is being considered by the producers of the *Newsletter*. Soon may it be formed and long may it prosper!*

A. C. B.

NORBERT DUFOURCQ, *La Vie musicale en France au Siècle de Louis XIV: Nicolas Lebègue*— 1631-1702. (Paris: Editions Picard et cie.) 1954. 217 pp. 16 plates.

Nicolas Lebègue was a predecessor of Norbert Dufourcq as the Organist at St. Mery de Paris. He was also one of the four (and apparently the most highly esteemed) organists of the Chapel Royal under Louis XIV. These distinctions he achieved within a very short time of his arrival in Paris from his native Laon, with very little influence to help him in the Capital.

Norbert Dufourcq links this biographical study with musical development under Louis XIV and shows that Lebègue was the first composer to develop the secular style of organ music which flourished until the Revolution.

Lebègue possessed a remarkable combination of talents, for he was not only about the most famous executant of his day on harpsichord and organ, but he was also the pre-eminent organ consultant and in this capacity exerted a great influence on the development of the Classic French organ of the seventeenth and eighteenth centuries. Dufourcq claims no special virtues for Lebègue as a composer, apart from the innovations of style which he introduced. In this connection he gives a number of interesting directions for registration, as required by Lebègue.

In addition to such wide artistic qualifications, Lebègue was known as a man of the utmost integrity and generosity. Certainly such a man deserves a biographical memorial and Nicolas Lebègue is fortunate that his memory should be preserved by such a scholarly writer as his distinguished successor at St. Mery,

* Received after going to press, *Newsletter No.* 6, January 1956, announces the formation of the Society for Ethno-musicology, with the Newsletter *Ethno-musicology* its official organ, published three times a year (Secretary: David P. McAllester, Wesleyan University, Middletown, Conn., U.S.A.).

where the organ still contains much material from the time of Lebègue. It has been rebuilt since the war, under the direction of Monsieur Dufourcq, as an all-purpose organ which at the same time retains all the best features of the classical French organ.

As one expects of Dufourcq, the whole work is fully annotated as to sources, and is thus of wider musicological importance than its title might suggest.

It is shortly to be followed by the publication of the first and second books of music for harpsichord by Lebègue, published by Editions de l'Oiseau Lyre, edited by Norbert Dufourcq. C. C.

ALFRED CHAPUIS, *Histoire de la Boite à musique et de la Musique mécanique*. A publication of the Swiss Watch and Jewellery Journal, Lausanne, obtainable in Britain from Malcolm Gardner, 12 Earnshaw Street, London, W.C.2. In paper binding £7 10s.; in full cloth binding £8 10s.

This is a magnificently produced volume of 352 pages on art paper, with 300 illustrations and 9 colour plates. The book is in French but the captions to the illustrations are in both French and English.

The early history of the subject, up to about 1700, is dealt with somewhat cursorily which is a pity, as it is a period which would undoubtedly repay deeper research. Mechanical music in this period was represented mainly by mechanical organs, and carillons and musical clocks. The earliest surviving musical clock is English, by Nicholas Vallin, being dated 1598. It plays at each quarter on thirteen bells, actuated by a barrel. Unfortunately, like all known early barrels, it is not pinned, but provided for the changing of tunes at will (on large mechanical carillons this was the duty of the keeper of the Carillon). The invaluable musical evidence which this clock might have afforded is therefore inconclusive, and the present pinning is quite haphazard (the clock belongs to Mr C. A. Ilbert, the famous English collector). This clock is illustrated in the book but it is a most curious omission that there is no mention of the famous sixteenth century Dallam organ clock.

It is, however, on the eighteenth and nineteenth centuries that the book is at its best, which is perhaps understandable, being a Swiss publication, since it was during this period that the Swiss industry took shape.

Various famous pieces are described and illustrated in detail, including the 'Flute Player' by Jacques de Vaucanson; the very beautiful and complicated 'Berger' clock made by Jaquet-Droz for Ferdinand VI of Spain, in 1758; and the 'Lady Musician' also by Jaquet-Droz, where an automaton figure actually plays, with its fingers, a small organ with a keyboard.

The development of the musical box proper, from the invention of the tuned steel comb at the extreme end of the eighteenth century, is also traced.

English work is adequately represented and two of the superlative colour plates are of English musical automaton clocks.

Although not fully definitive, this book is the most important yet to be published on a subject which must certainly be reckoned as coming within the scope of musicological study and which can, at its best, provide invaluable evidence of style in contemporary performance. C. C.

RICHARD SCHULZE, *How to Build a Baroque Concert Harpsichord.* (New York: Pageant Press) 1954. 30 pp. 12 pp. drawings. $3.

A practical handbook on harpsichord construction has long been wanted by everyone interest in that instrument, whether or not they intend to build one. The present well-produced little volume by a member of the Galpin Society goes some way to fill the gap; but it is as well to understand that by 'Baroque concert harpsichord' Mr Schulze means something quite different from the typical eighteenth-century English mahogany-cased two-decker. The type he advocates, hitherto sadly neglected by modern makers, is the lightly built 'Italian' instrument, of four octaves compass or thereabouts, with two eight-foot registers only, preferably fixed rather than movable. This he contends is adequate for most of its authentic occasions. There is something to be said for this austere view-point at a time when the urge to build 'bigger and better' harpsichords is being carried, literally, to such lengths that they begin to overhang most convenient-sized platforms. Clearly, this simpler approach is salutary, for it emphasizes a cardinal principle not always appreciated in connection with plucked stringed instruments—that their tonal effectiveness varies inversely with soundboard load.

Whether Mr Schulze pleads his cause with the right arguments, and indeed, how effectual his tabloid method of instruction will turn out in practice, are perhaps open to question. The 'how to build' part of the book occupies a mere seventeen pages of text. True, it is backed by a series of admirable working drawings; but while no experienced wood-worker will require to be spoon-fed, he will rightly expect to find in these pages certain vital information peculiar to the subject in hand. He will want exact details of the preferred scaling—what string lengths and gauges to adopt at all critical points, where to break from steels to brasses, and so on. He will want some guidance on the delicate processes involved in making the jacks—how to mount the plectra in the tongues and how to drill for the springs so that they bear on exactly the right spot. Mr Schulze is inclined to leave these matters to the judgment of the reader, which may be flattering but is hardly helpful.

Half-a-dozen pages are devoted to 'Some Historical Remarks', mainly in support of the view that this type of instrument is right and English eighteenth-century makers were wrong. But if we are going to split hairs about this, Shudi, twice described as a 'very late eighteenth-century maker', was producing two-manual harpsichords in 1729; the Venetian swell was used by him as early as 1766, when the pianoforte had made scarcely any impact in this country, so that as a 'last ditch' contrivance the swell was about twenty years too soon. The statement (attributed to Mr Frank Hubbard) that the four-foot register formed no part of the 'grand jeu' is not borne out by existing English instruments, on all of which the machine pedal cancels the four-foot first of all when operated. If the four-foot was never included in the *tutti*, why arrange for its withdrawal when producing power?

But although we may disagree with Mr Schulze over such matters, there can be no denying that, in urging the revival of a smaller and simpler type of

instrument he is anticipating a need which will shortly make itself felt. For between the present-day mammoths and the single strung 'triangles' and other semi-portable types there is fixed an ever-widening gulf. Solo keyboard music apart, chamber works for small ensembles do not require that the continuo instrument shall include the kitchen stove among its accessories. And if professional makers are unwilling to cater for the unambitious in this matter, then, like Mr Schulze, we shall be constrained to build our own. Nothing could be more completely in accord with the ideals of this Society! E. H.

Organs in Parish Churches. Notes prepared by the Organs Advisory Committee of the Central Council for the Care of Churches. (London: the Church Information Board, Church House, SW1.) 1955. 8 pp. 9*d*.

This valuable booklet contains concise and sound practical advice on a number of important aspects such as siting, position of console, size, action, rebuilding, tonal improvement, the preservation of historic masterpieces, barrel organs, secondhand instruments, electrones, cases, etc., and cannot be too strongly recommended to Church councils, especially if they are considering rebuilding or acquisition of a new instrument. Three points in particular are stressed about which there is still much prejudice: the advantages of a west end organ, the musical and mechanical superiority of tracker action, and the type of organ suitable for small village churches. A specification of the two diapasons, principal and fifteenth is recommended and also the use of the attractive one-manual organs which were made in the earlier part of the last century.

G. F. O.

REVIEWERS:

A.C.B.	Anthony Baines	E.H.	Eric Halfpenny
C.C.	Cecil Clutton	G.F.O.	Guy Oldham